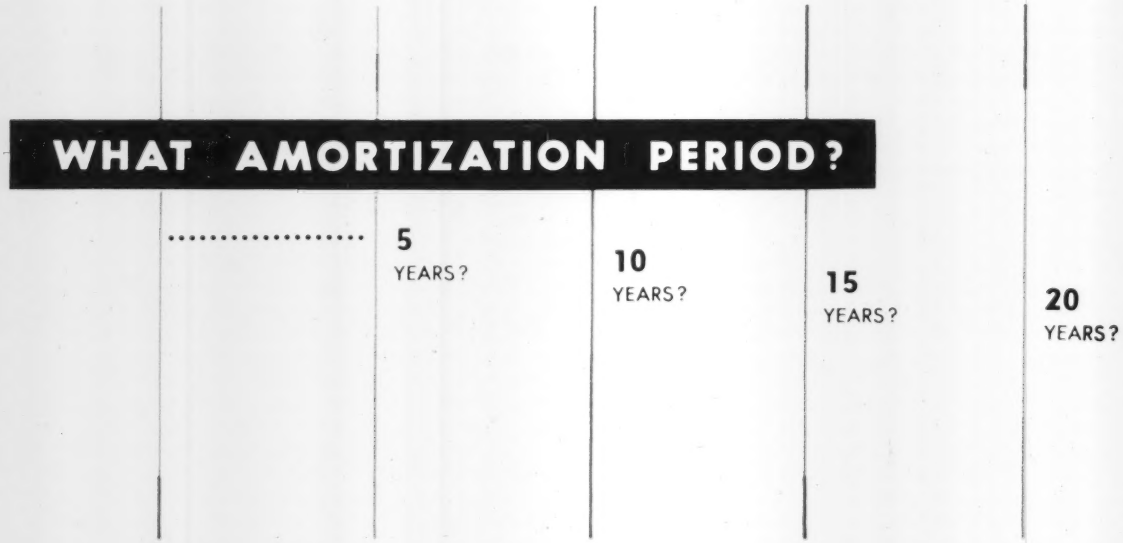
NOVEMBER 2, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



COMING . . .

Depreciation Reform

No. 9 of a Management Series

Odds are good that injurious U. S. tax practices will be remedied by the next Congress—p. 79

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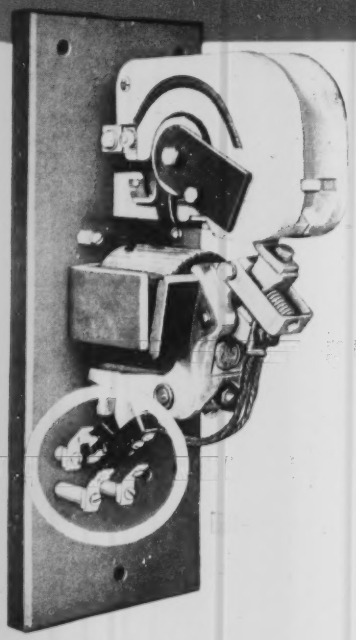
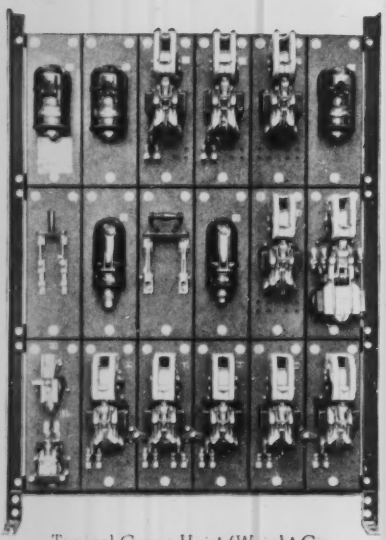
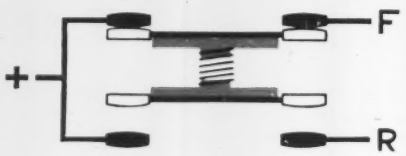
Safer Electrical Interlocking on All EC&M *LINE-ARC* CONTACTORS





Typical Crane-Hoist (Wright Circuit) Controller with improved *LINE-ARC* Contactors.



Two sets of double-break contacts — isolated from each other — no carry-over from one to the other by an arc.

A Good Reason for Specifying E C & M Magnetic Control

Magnetic contactor controllers use electrical interlocks to maintain safe motor connections, to regulate sequence of contactor operation, and for other important functions that promote efficient operation of motors or of control or of both motors and control.

On controllers using the EC&M *improved* LINE-ARC Contactors, a NEW Interlock provides *safer* interlocking with *lower* maintenance. The new upper and lower stationary contacts have double-faced contacts which can be moved from one position to the other for double the wear.

Movable contacts, carried in an insulated slotted frame attached to the contactor arm from the front, are easily inserted or removed without tools. The normally-open contact bridge is *isolated* from the normally-closed bridge by two insulators (shown in red in the sketch above). These insulators keep the spring in alignment and *prevent* the spring from carrying current from one bridge to the other.

Coin-silver contacts are used on these new electrical interlocks. With two movable contact bridges (instead of one previously used) and each *isolated* from the other, normally-closed circuits *cannot be carried over* by an arc to *normally-open* circuits or vice versa.

Safer electrical interlocks — a good reason for specifying EC&M Magnetic Control.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Standard Grades of Alloy Steel Will Often Do the Job

In many instances you can meet alloy steel requirements with standard grades. Applications, civilian or military, that really require the temperamental special grades are relatively few.

In the "special" bracket are the jobs where resistance to heat, corrosion, or low-temperature impact is the prime consideration. Here, generally speaking, you have to call upon other than standard grades. Bethlehem is usually able to supply them.

But wherever feasible, it is to your advantage to specify standard analyses—mainly for these reasons:

1. Standard grades meet the usual requirements for hardness, strength, and ductility.

2. With standard grades, chemical ranges usually fall within closer limits than those of special grades; hence you can use the conventional, more familiar—and often less costly—methods of heat-treating.

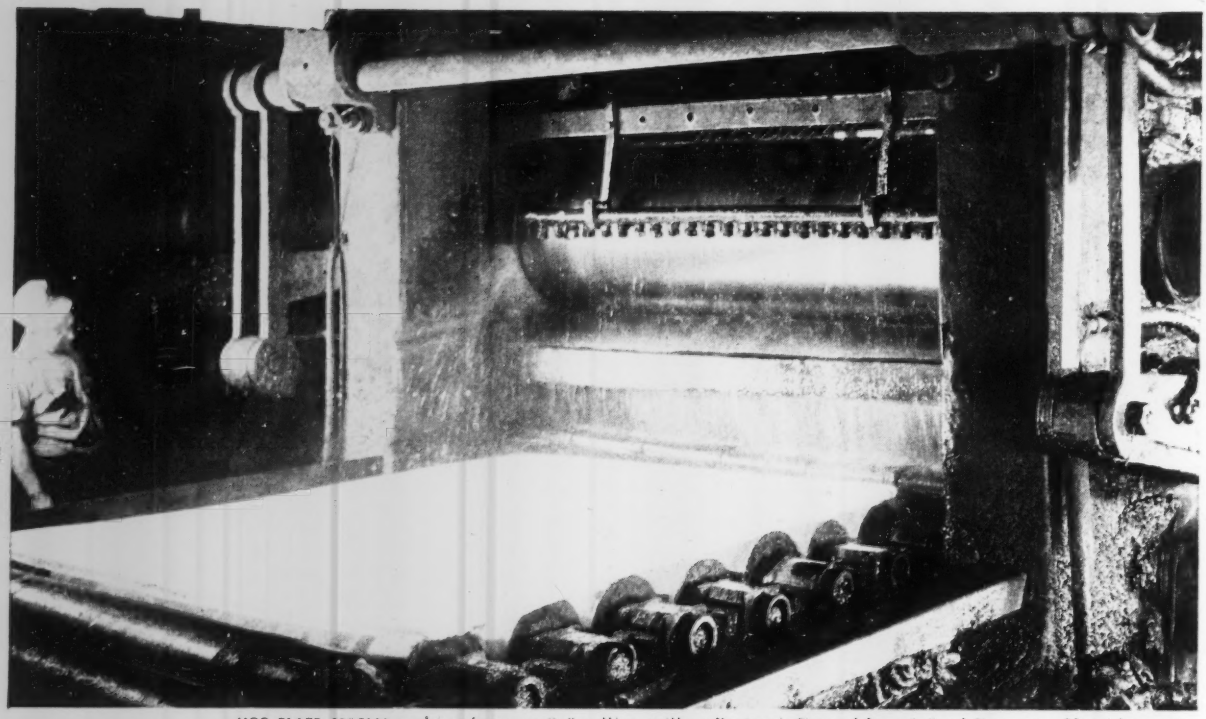
3. You can normally buy standard-grade steels in small tonnages, keeping your inventory low. In contrast, the user who orders an other than standard grade must in most instances specify a heat lot.

Bethlehem manufactures all AISI grades and special-analysis steels, and the full range of carbon steels. Please remember that we can always furnish the grade you wish, whether standard or special. But if there's any question of choice, anything not quite clear concerning grades and their applications, by all means discuss the problem with our metallurgists. They are always at your service.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEELS



HOT PLATE SPECIAL rushing from an 89" rolling mill at Barium's Central Iron & Steel Company, Harrisburg, Pa.

Here comes next year's luxury liner

Or a giant oil storage tank *or* a freight car *or* a bridge for a super highway.

Wherever it goes, however, high-quality steel plate from Barium's 100-year-old Central Iron & Steel Company rates a warm welcome. And it goes nearly everywhere in basic industry—petroleum, transportation, shipping and construction.

Plate steel is only one of a long list of Barium steel products. In fact, few other steel companies make so many different things.

And when you deal with Barium, you draw on a 16-company reservoir of engineering knowledge and production experience hard to match even in much larger companies.

Maybe that's why so many essential products you see today—from tiny instrument springs to 20,000-barrel tanker barges—wear Barium nameplates. We'll be glad to tell you what's behind this name. Write Barium Steel Corporation, 25 Broad St., New York 4, New York.

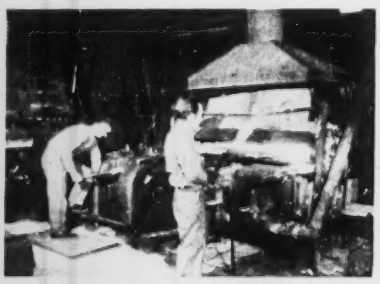
BARIUM STEEL CORPORATION

Sixteen integrated companies working in STEEL • MAGNESIUM • ALUMINUM • FIBERGLAS

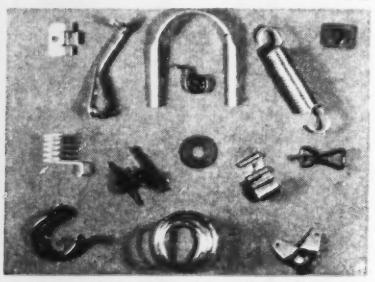
BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE, INC. • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

3.3

HAMMERING HOME its point is this drop forge at Barium's Globe Forge, Inc., Syracuse, N. Y. Globe forges a wide range of products, from automotive gear blanks to rocket components and tank parts, specializes in intricate customer-specified jobs.



BIG BOLTS are these 2 in. diameter steel heavyweights being forged on an Acme machine at Barium's Bayonne Bolt Corp., Bayonne, N. J. Bayonne makes standard and special fasteners from 1/4 in. to 4 in. in diameter.



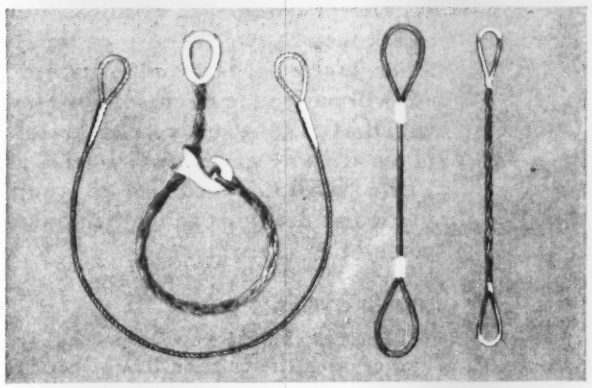
GROUP PORTRAIT showing a few of the almost endless variety of extension, compression and torsion springs, wire forms and flat springs made by Barium's Cuyahoga Spring Co., Cleveland, O. At middle right is famous Snap-Clip.

PREFORMED INTERNALLY LUBRICATED

Wire Rope

for cranes, hoists, elevators, and all equipment

From Macwhyte's complete line of a thousand and one sizes and types, you get the right rope for your equipment. Thoroughly lubricated, PREformed, engineered to give long, low-cost service. *Send for Catalog G-15.*

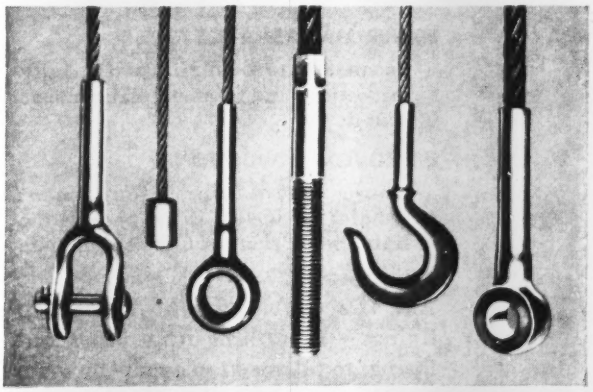


WIRE ROPE

Slings

for lifting and moving materials, equipment in production or maintenance

There are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. *Send for Catalog S-8.*



WIRE ROPE

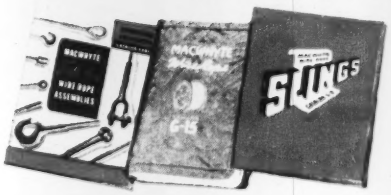
Assemblies

for machine parts, controls, and operating devices

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. *Send for Catalog 5201.*

MACWHYTE

These catalogs available on request



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KENOSHA, WIS.

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Seattle • San Francisco • Los Angeles
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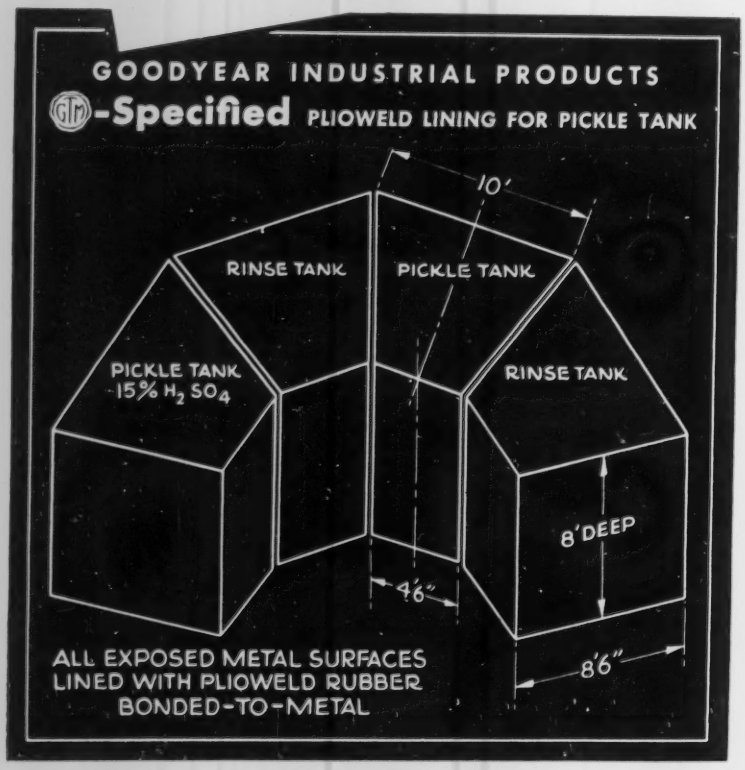
Another PLIOWELD Success

RUBBER LINING IN PICKLE TANK GIVES 4 TIMES THE SERVICE

TANK LINING

15% solution of H_2SO_4, operating at 200°F., used in batch pickling tanks for major appliances. Ordinary mastic type plastic lining formerly used failed in abusive service after 6 months service—cost 1½ times Goodyear's bonded-to-metal lining of PLIOWELD rubber that served 2 years to date and still is in service.

Additional advantage — PLIOWELD can be quickly and easily repaired as needed.



Whenever corrosives or abrasives attack metal surfaces—in pipe lines, tanks, tank cars, fans and ducts, etc. —it will pay you to discuss PLIOWELD with the G.T.M.—Goodyear Technical Man. He will gladly recommend a PLIOWELD lining matched to your particular needs — one that will give you all these benefits:

LOWER OVER-ALL COST

because PLIOWELD measurably increases the service life of costly equipment

LOWER MAINTENANCE COSTS

because PLIOWELD eliminates daily inspections and frequent maintenance shut-downs

IMPROVED PRODUCTION

where PLIOWELD-lined equipment handles production items, because the lining won't slough off or contaminate liquids.

Ask the G.T.M. about PLIOWELD linings — everything from pipes and fittings to railroad tank cars—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose (air, water, steam, oil, special), Belting (V-belts, transmission, conveyor, elevator), and other industrial rubber products. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

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We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

This Week in Metalworking

STEEL

Vol. 133 No. 18 November 2, 1953

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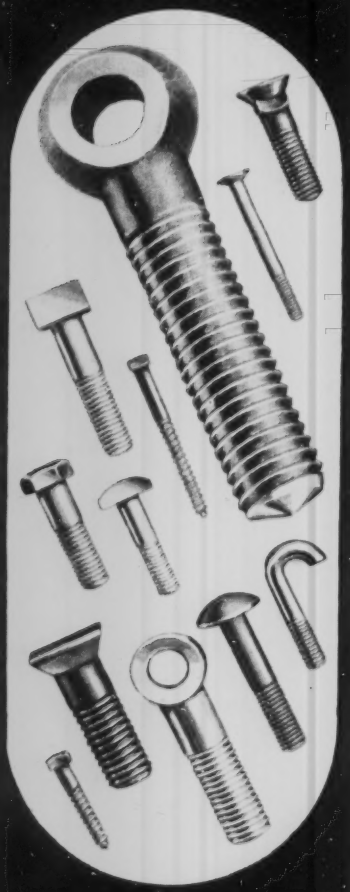
THREADED SPECIALTIES

EYE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T. M. REG.

behind the scenes

Metalworking Is Big

It's a whopping big business, this metalworking industry in which you work. Fact is, it's big enough to employ 7.7 million people . . . a full 45% of the total persons employed in all types of manufacturing industries.

Top employers are manufacturers of transportation equipment who list just short of 2 million people on their payrolls. Close behind are the manufacturers of machinery (except electrical) with 1.7 million, manufacturers of primary metals with 1.3 million, manufacturers of electrical machinery with 1.2 million, manufacturers of fabricated metal parts with 1.1 million and finally instrument manufacturers who employ 332,500 people.

Wisdom Is Ageless

Cal Fisher, STEEL's New England regional manager, sent us a reproduction of *The Connecticut Courant*, issue number 00, published in Hartford, on Monday, Oct. 29, 1764. Yes, we said 1764!

This, according to Cal, is a replica of the first issue of *The Courant*, published 12 years before the American Revolution, and is the oldest newspaper in the United States.

We were particularly intrigued by the editorial which spread across the entire top half of the 8 inch by 13 inch sheet. Here is a quotation from it which we feel is particularly significant today despite the fact that it was written approximately 190 years ago:

"Of all the Arts which have been introduc'd amongst Mankind, for the civilizing Human-Nature, and rendering Life agreeable and happy, none appear of greater Advantage than that of Printing; for hereby the Greatest Genius's of all Ages, and Nations, live and speak for the Benefit of future Generations.

"Was it not for the Press, we should be left almost intirely ignorant of all those noble Sentiments which the Antients were endow'd with.

"By this Art, Men are brought acquainted with each other.

"The CONNECTICUT COURANT will on due Encouragement be continued every Monday: Which Encouragement we hope to deserve, by a constant Endeavour to render this Paper useful, and entertaining, not only as a Channel for News, but assisting to all those who may have Occasion to make use of it as an advertiser."

The above might, with a few changes in idiom, spelling and punctuation, have been written about STEEL magazine as recently as right this minute.

It says, in essence, that to exist, a publication must serve a useful purpose. If it serves such a purpose, it will attract interested readers who in turn will attract interested advertisers.

Thomas Green knew it back in 1764 and *The Connecticut Courant* is still alive today as *The Hartford Courant*.

STEEL became 72 years old this year!

See Page 79

"Coming: Depreciation Reform" . . . we suggest you read it on page 79 of this issue. It's the ninth installment in STEEL's 1953 Program for Management series and is authored by John Morgan, assistant managing editor.

Metalworking management has been asking for this one. It's an exceptionally fine example of interpretive writing based on "right from the horse's mouth" information. You can put its information to work right now.

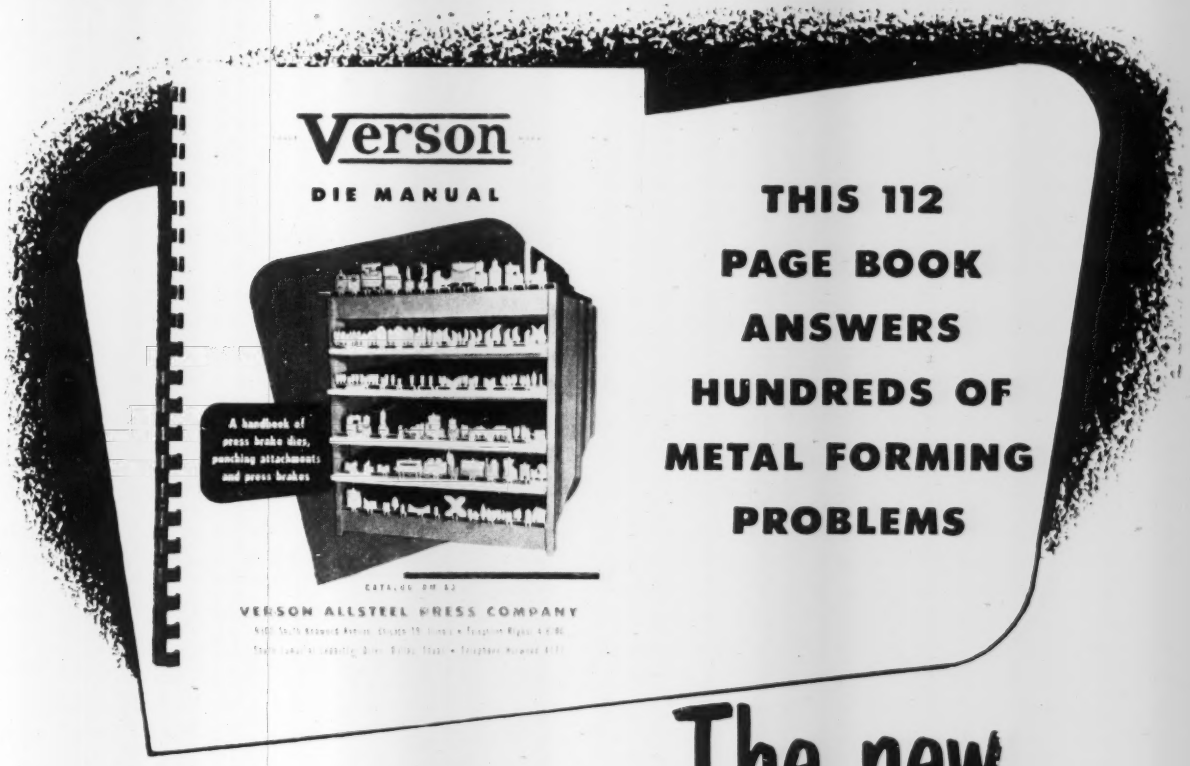
Nice Going, Doc!

Due for publication this month is a 553-page book, *Modern Electroplating*, sponsored by the Electrochemical Society. The editor of this authoritative source book is our own Technical Editor Dr. Allen Gray. Publisher is John Wiley & Sons Inc., New York.

Another pretty feather in your cap, Doc.

Shrdlu

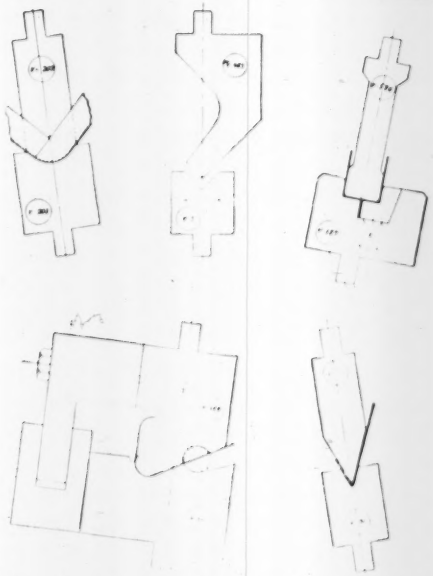
(Metalworking Outlook—Page 31)


Verson
DIE MANUAL
A handbook of press brake dies, punching attachments and press brakes
VERSON ALLSTEEL PRESS COMPANY
THIS 112 PAGE BOOK ANSWERS HUNDREDS OF METAL FORMING PROBLEMS

The new TRADE Verson DIE MANUAL

DM-53

AVAILABLE NOW



JUST off the press, the new enlarged Silver Anniversary edition of the Verson Die Manual contains 112 pages devoted to a pictorial presentation of Verson press brake dies and special tooling along with detailed text and tables on how to select dies for specific jobs, tonnages required, etc. Representing the culmination of twenty-five years of Verson Die Manuals, this edition has been developed and organized to be as convenient and helpful to the user as we know how to make it, even to the point of incorporating a plastic binding that permits the book to lay flat wherever it is opened. While the Manual does not show every possible press brake die, it is remarkably complete and covers all commonly used types. To get your copy simply write on your company letterhead.

A Verson Press for every job from 60 tons up.

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Continuous threads cut on studs must meet exacting requirements to withstand the high pressures and temperatures to which pressure vessels, steel pipe flanges, fittings, and valves are subjected.

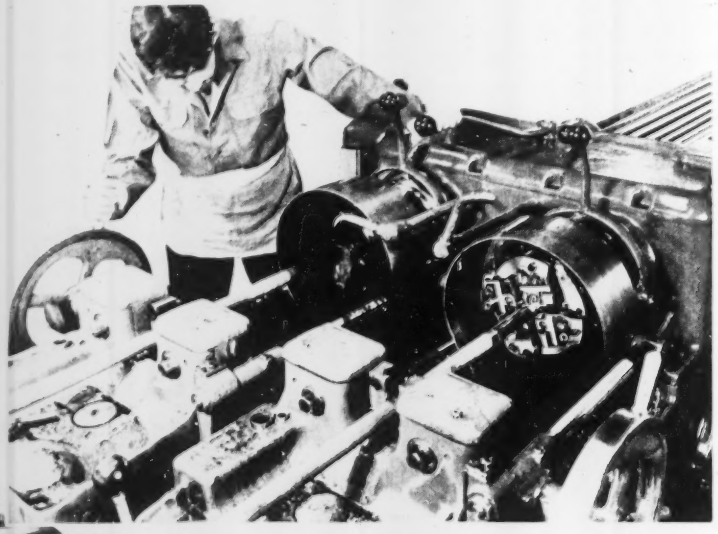
At the R.E.C. Corporation, New Rochelle, N. Y., continuous 1 3/8" 8P threads are cut to within pitch diameter limits of .002 on 12-foot heat-treated bar stock of 269 to 311 Brinell hardness. The fully threaded bars are then cut into the desired stud lengths.

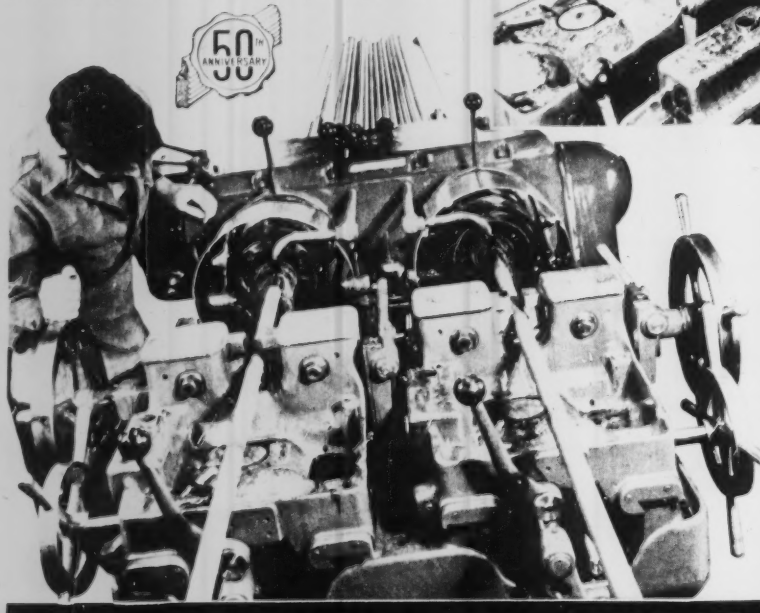
By using Double Head LANDMACO Leadscrew Threading Machines equipped with Hardened and Ground 2" LANCO VV Heads, threads ranging in diameter from 1/2" to 2" are cut in one pass with consistently fine finish to Class 7 tolerances. The leadscrew provides a positive, mechanical means of feeding the work into the die heads, thus assuring the maintenance of close lead tolerances.

Even on this precision threading operation, net production is good, averaging 36 linear feet per hour at a cutting speed of 25 surface feet per minute. An average of 108 linear feet of threads is cut between chaser regrindings, resulting in low tool cost and minimum down time.

Having given many similar outstanding performances in other fields, LANDMACO Machines can help to cut costs, step up output, and improve finish and accuracy in your thread production.

For complete information, write for Bulletin H-75.

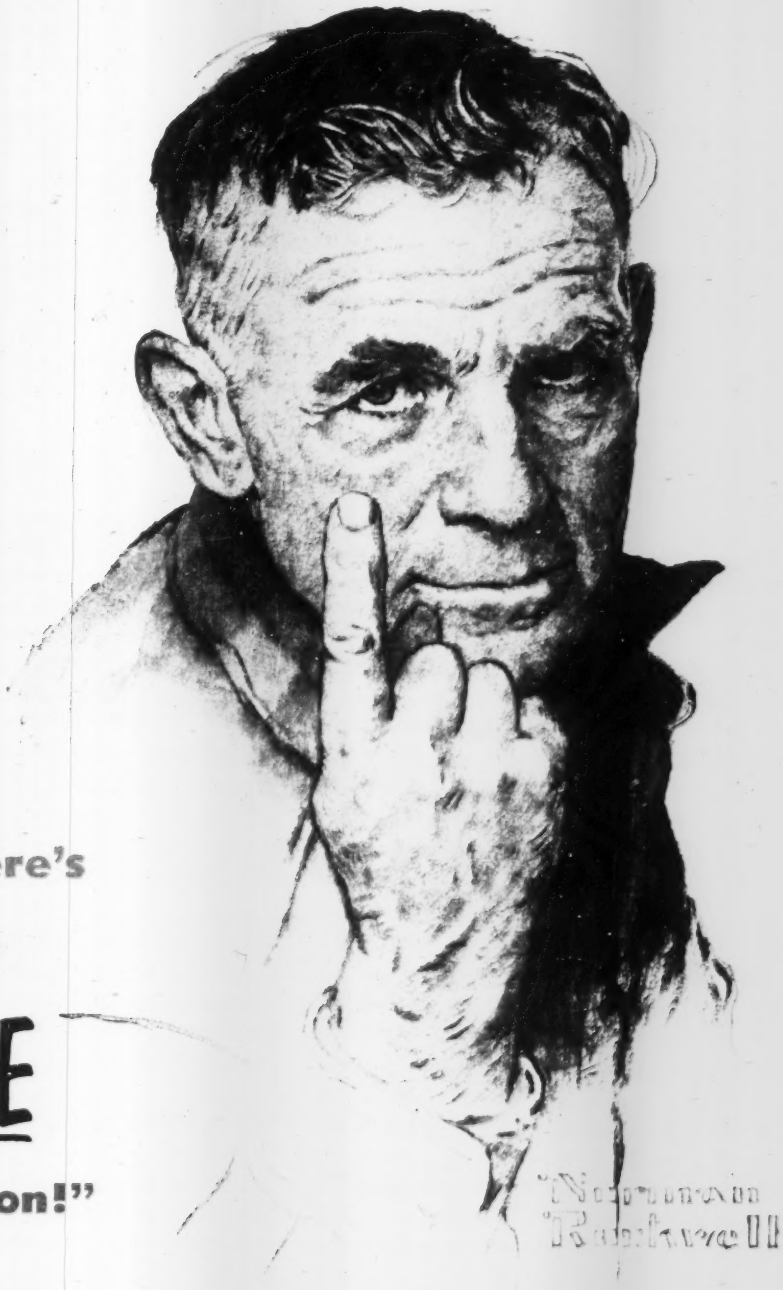




LANDIS
MACHINE
COMPANY

WAYNESBORO, PENNSYLVANIA

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS



"There's only ONE reason!"

IT'S JUST THAT SIMPLE. There's only one reason in the world why so many wire rope users in the industrial field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your operations.

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hovering over your plant,
fire is ready to swoop down on
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equipment, record vaults.
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casts a warning shadow... IF
you have a KIDDE Industrial
Smoke Detector.

Kidde

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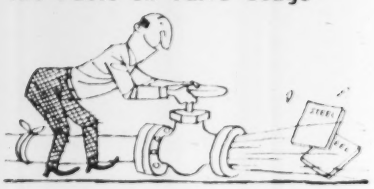
LETTERS
TO THE EDITORS

The Facts on Valve Usage



MAY WE HAVE PERMISSION TO COPY YOUR SPLENDID ARTICLE ON VALVES (Oct. 19, p. 56)? WE WOULD LIKE TO SEND COPIES OF THIS ARTICLE TO MEMBERS.

George A. Cooper
secretary-treasurer
Valve Manufacturers Association
New York

• *Permission granted.—ED.*

A Boost for Gas Plating

Your article "Gas Plating Offers Versatility" (Oct. 19, p. 120) is certainly a very fine piece of work. Will you ask your Reprint Department to advise us the cost of securing 5000 reprints which we would like to send out to our potential customers in industry?

H. A. Toulmin Jr.
Toulmin & Toulmin
Dayton, O.

• *Quotations are being sent.—ED.*

Fire Prevention Stressed

Your editorial entitled "Worse Than in War" (Aug. 31, p. 25) was an excellent editorial. In my opinion, it certainly is going to hit home to a great many in the metalworking industry.

We are asking your permission to reprint your editorial for distribution within the company to our people concerned with fire prevention.

E. L. Hummel
treasurer
Rapids-Standard Co., Inc.
Grand Rapids, Mich.

• *Permission granted.—ED.*

Do More with Nickel

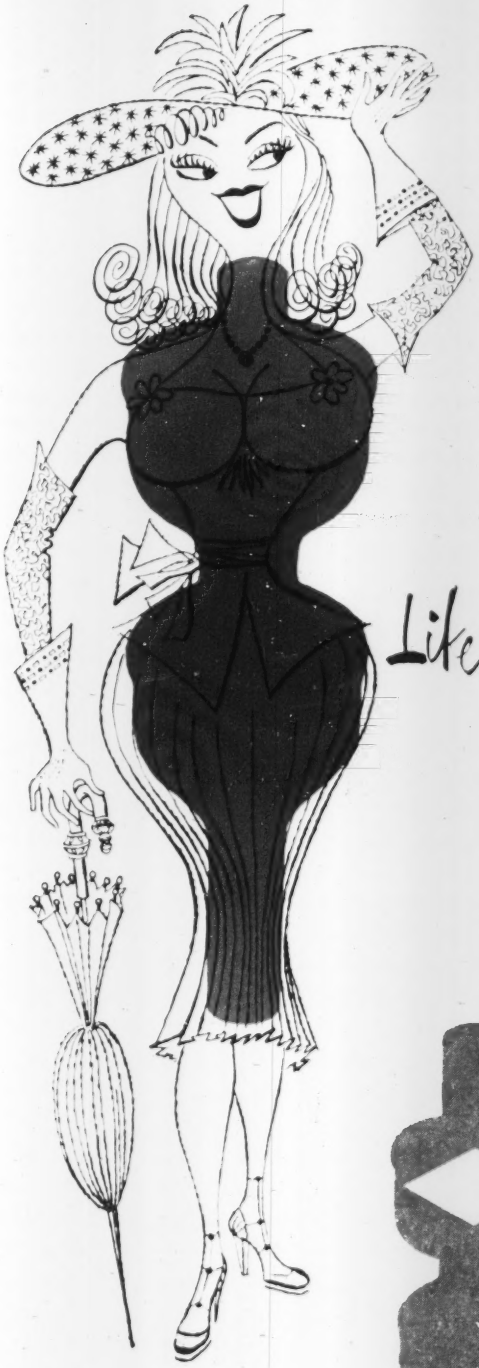
It seems to me that I saw an article a while back in STEEL regarding the casting of alloy and stainless steels.

We are interested in someone who can cast either 4340 alloy steel or 410 ferritic stainless steel in the shape of torpedo propellers with Timken cone hub and two blades each of which is $4\frac{1}{2}$ inches long by $2\frac{1}{2}$ inches wide and tapering from $\frac{1}{2}$ inch thickness at the hub. If you can suggest the names of any concerns which can cast such metals in the shape of such torpedo propellers, I would appreciate receiving them.

M. V. Little
assistant general manager
Al-Fin Division
Fairchild Engine & Airplane Corp.
Farmingdale, L. I., N. Y.

• *We believe you are referring to the article "Doing More with Less Nickel" (Aug. 3, p. 134) by Ernest A. Schoefer, executive vice president, Alloy Casting*

Please turn to page 12



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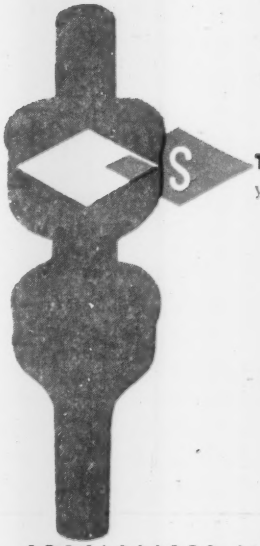

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FOR SPECIAL REAMERS . . . REMEMBER

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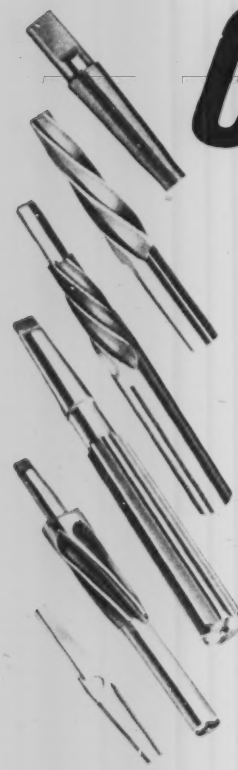

They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

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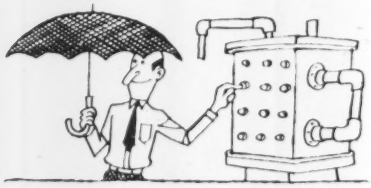
LETTERS

Concluded from page 10

Institute, Mineola, N. Y. We suggest you write Mr. Schoefer for a list of manufacturers which might be able to perform the job you have in mind.—ED.

Research on Heat Pumps



I do not usually receive your publication, but I am quite interested in your article "Push-Button Weather from Heat Pumps" (Sept. 21, p. 86) which states some 200,000 may be sold annually by 1960. If you could send me a copy of that article, I would be most grateful.

W. R. Lund, manager
Marketing Research
Warren Petroleum Corp.
Tulsa, Okla.

• *Sent.—ED.*

Small Business Labor Relations

In your article "A Job for Management: Better Labor Relations" (Sept. 7, p. 101), No. 7 in STEEL's Program for Management, a reference was made to the booklet "Successful Labor Relations for Small Business" by James M. Black and J. George Piccoli. Is it possible for you to give the address or the procedure to use to obtain this booklet?

John F. Loprest
116 N. 18th St.
Richmond, Ind.

• *"Successful Labor Relations for Small Business" is a full-length book and may be obtained either through the McGraw-Hill Book Co. Inc., New York, or from* STEEL, *Penton Bldg., Cleveland 13.—ED.*

More Interest in Up-Rating

Would you please send me a tearsheet of the article "Up-Rated Motors—Bigger Inside, Smaller Outside" (Sept. 21, pp. 128-130)?

Lynn Donelan
Atomic Equipment Department
Westinghouse Electric Corp.
McKeesport, Pa.

We would appreciate receiving ten tearsheets . . .

B. S. Nelson
chief engineer
Foote Brothers Gear & Machine Corp.
Chicago

We are very much interested . . . please send us ten reprints.

William D. Gruber
assistant purchasing agent
Cerro de Pasco Corp.
New York

. . . I will appreciate it very much if you will send to my personal attention another copy of this issue. Also, please advise me on the possibility of obtaining approximately 25 reprints of the article.

W. F. Lisman
Sales Department
Brown-Brockmeyer Co.
Dayton, O.

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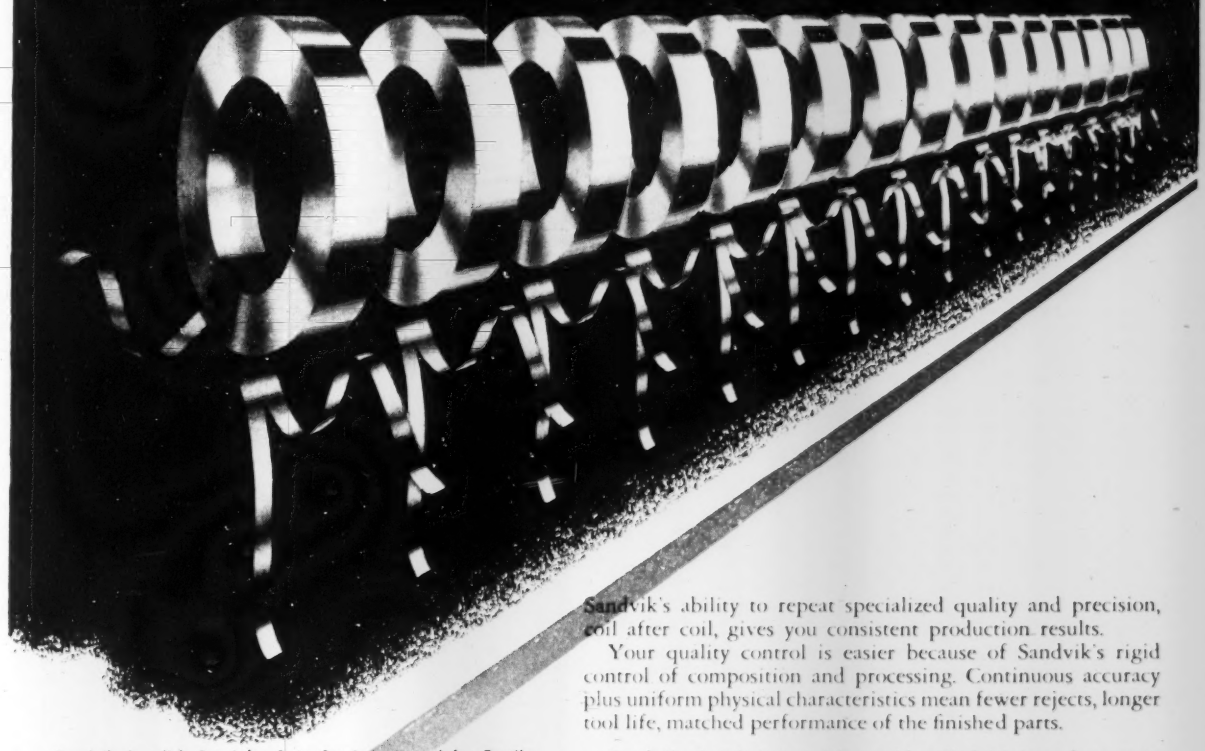
gives you continuous quality production



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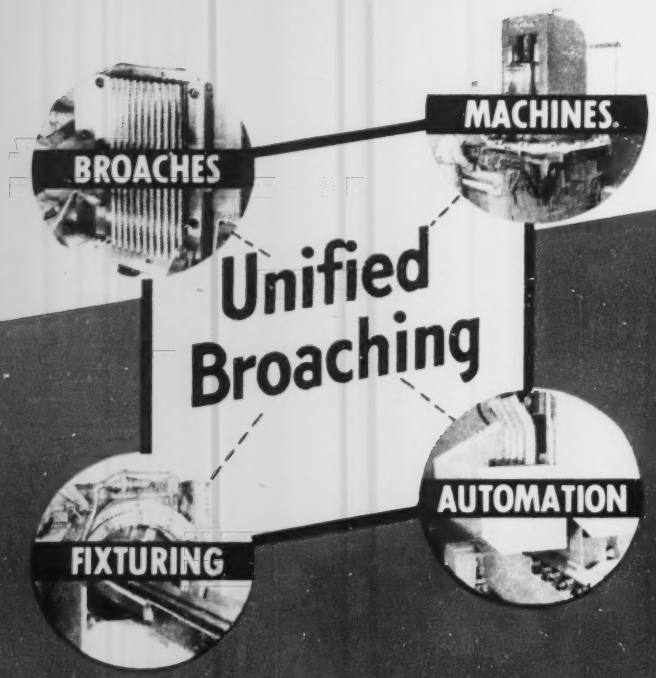

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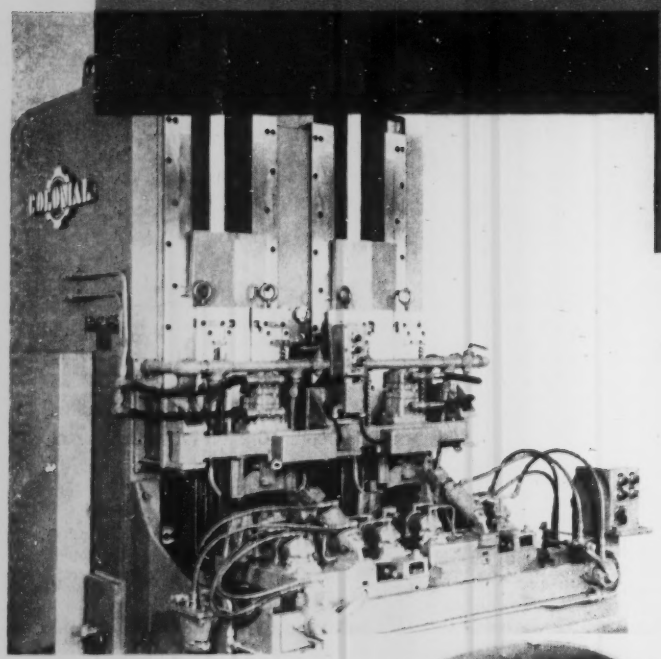

400 Brake Shoes Broached per Hour

Here a 1 2-inch slot and a 13 32-inch concave are broached at opposite ends of 400 brake shoes per hour. Stock removed is 3 32-inch.

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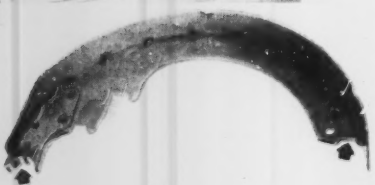

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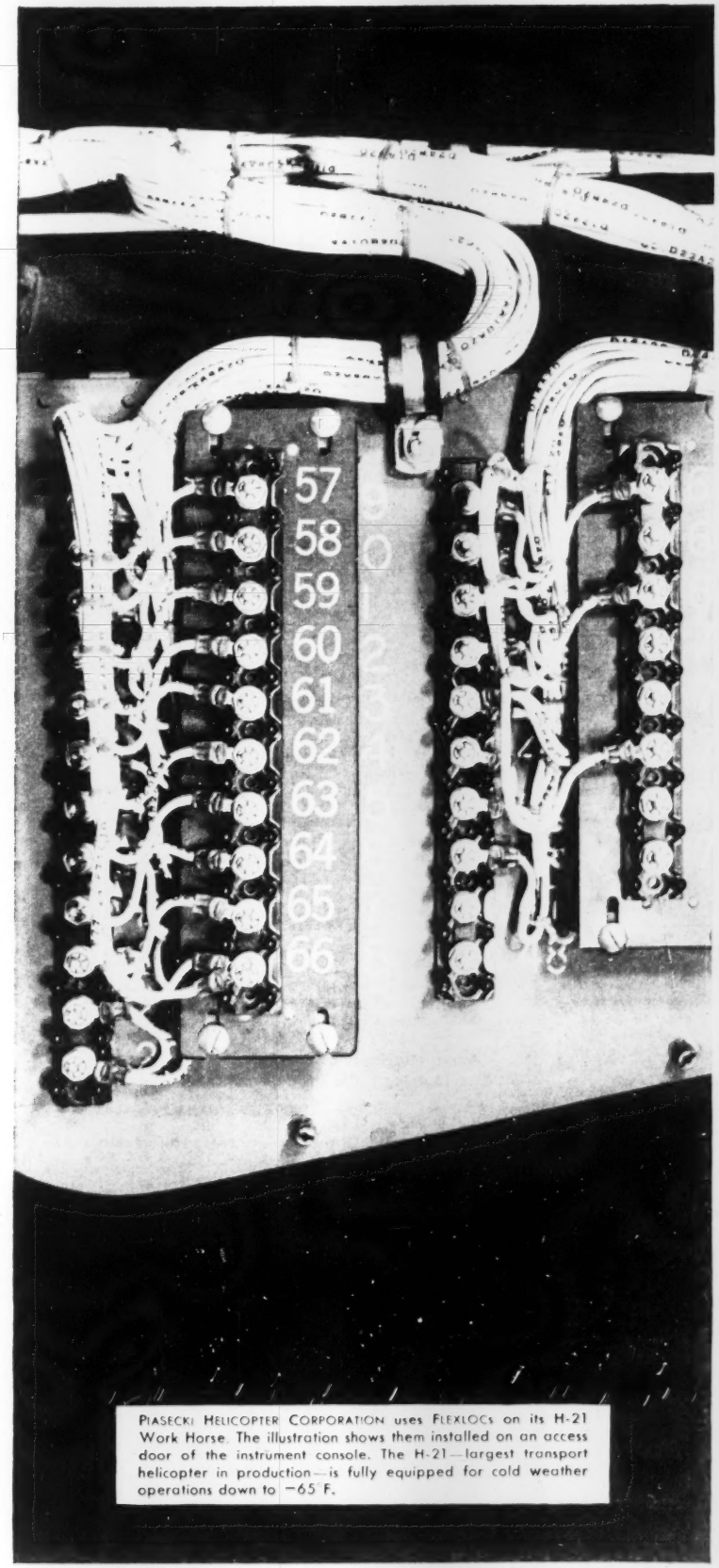
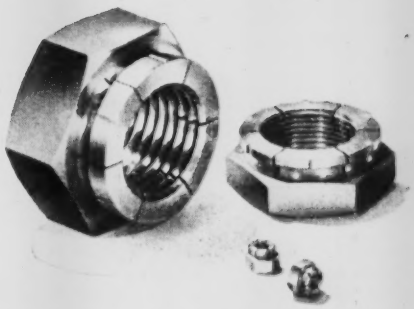


PIASECKI HELICOPTER CORPORATION uses FLEXLOCs on its H-21 Work Horse. The illustration shows them installed on an access door of the instrument console. The H-21—largest transport helicopter in production—is fully equipped for cold weather operations down to −65° F.



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FLEXLOCs save production and maintenance time. They are one piece, all metal—nothing to assemble, come apart, lose or forget. Standard FLEXLOCs have higher tensile than most other nuts—and because they are all metal, are not affected by temperatures to 550°F.

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LOCKNUT DIVISION

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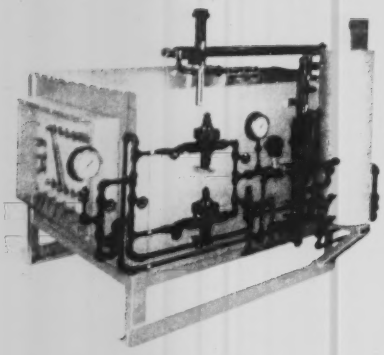

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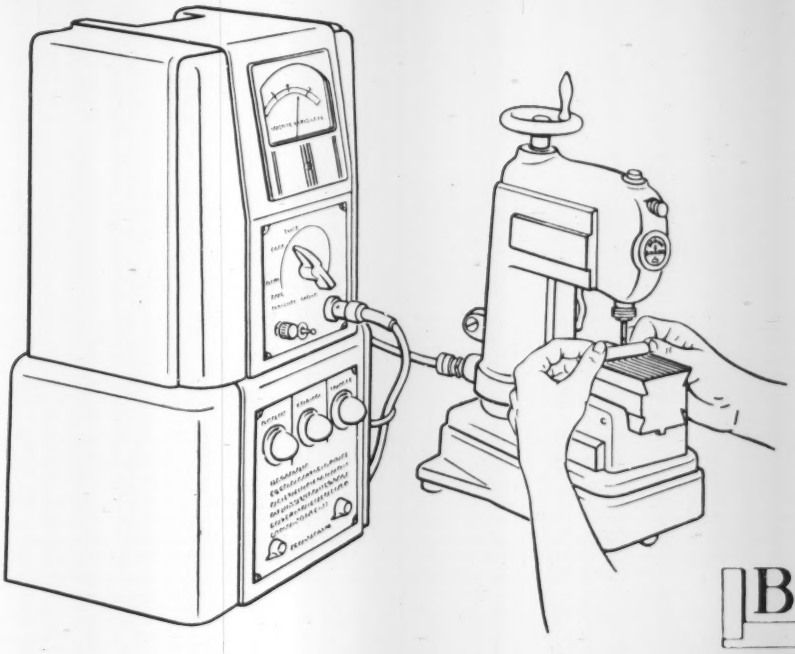

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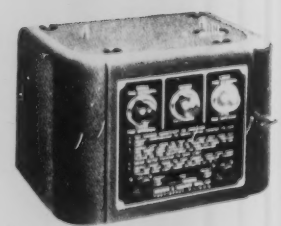

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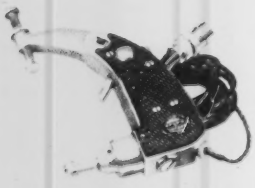

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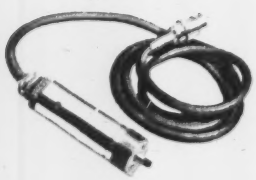
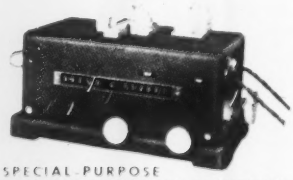


GAGE HEAD CARTRIDGE



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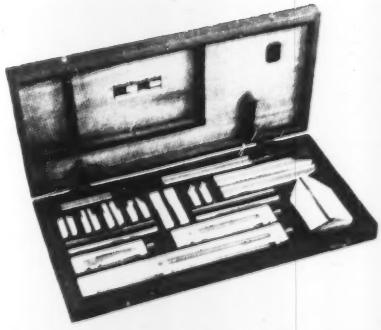

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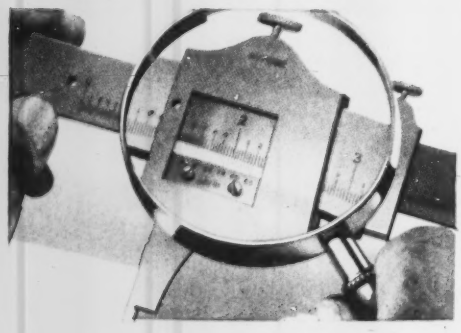

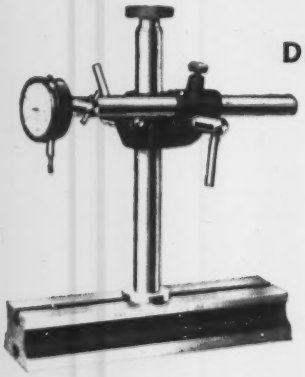

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WITH FARREL® ROLL GRINDERS

These machines are extremely fast for either heavy roughing or producing as high a mirror finish as it is possible to obtain with wheels at present available. They grind straight, convex or concave rolls.

The crowning device produces a mathematically accurate curve, symmetrical on both halves of the roll, for either a convex or concave shape. It is easily and quickly set and requires no manipulation during operation. The same setting invariably produces exactly the same curvature and permits fixed, uniform and easily controlled accuracy of contour in all rolls.

Farrel roll grinders are available in two types and nine standard sizes. Write for descriptive bulletins.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia & Derby, Conn., Buffalo, N. Y.

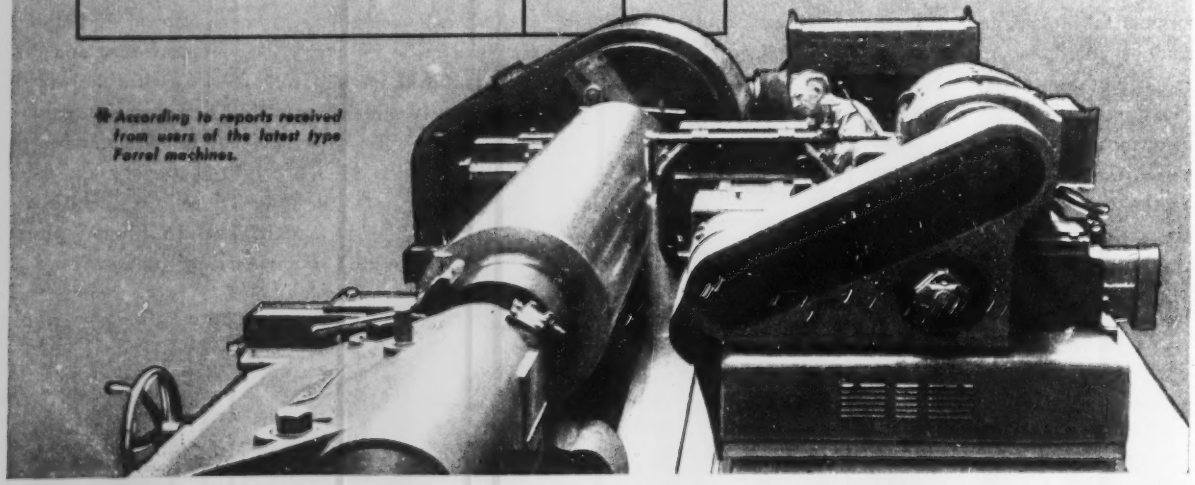
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

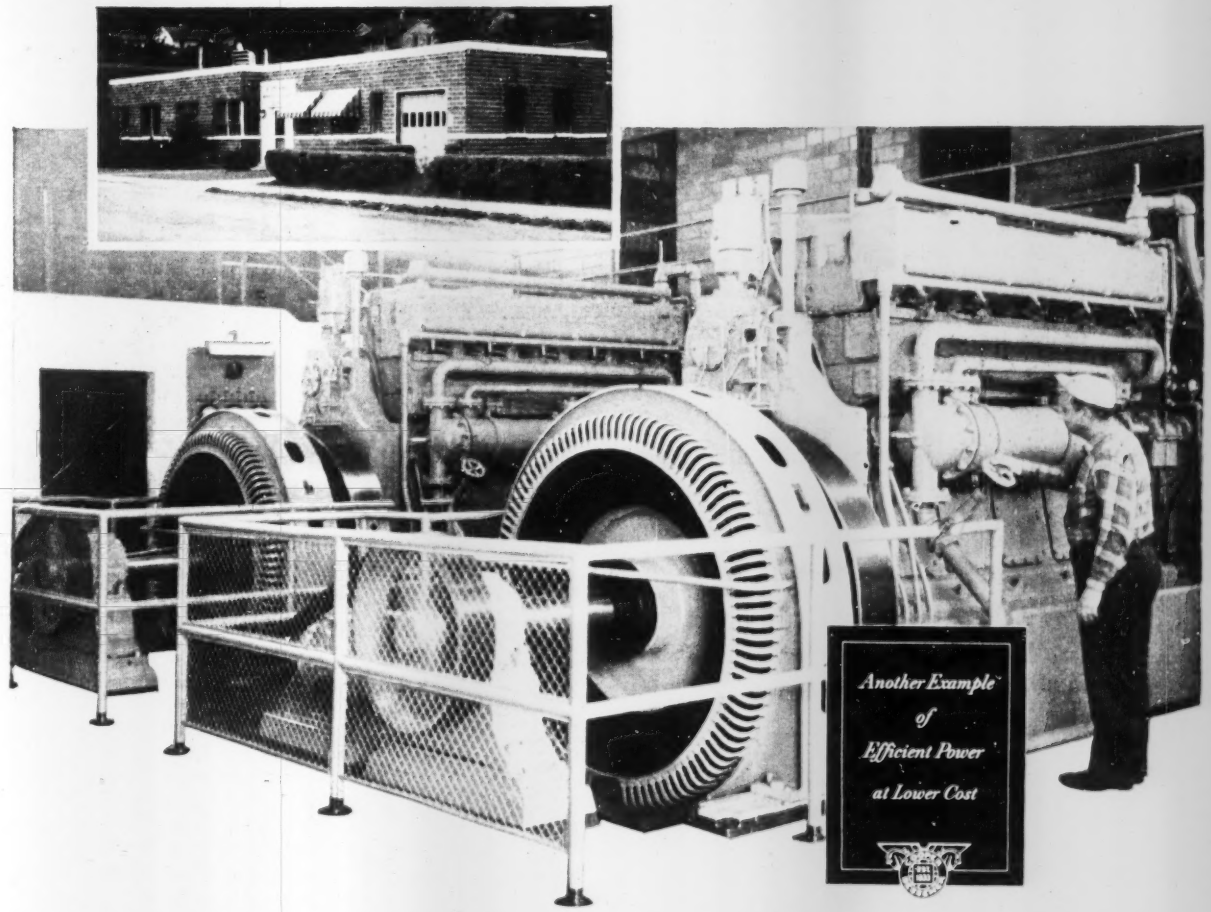
Farrel-Birmingham®

FB 799

	You Save Time	You Save Money
Many automatic features reduce setting-up time to a minimum	✓	✓
*Rolls are ground faster	✓	✓
Because of the machine's exceptionally smooth and vibration-free action, less metal has to be removed to clean up a roll. This reduces the frequency of roll replacements		✓

*According to reports received from users of the latest type Farrel machines.





How McGregor turned a Power Problem into $10,000 yearly profit!

TEN years ago, undependable electric power service forced McGregor, Iowa, to build their own plant.

It has proved to be a very profitable investment. Not only is the plant paying for itself . . . last year a net profit of $10,711.62 remained after expenses, depreciation, and bond retirement.

The McGregor plant is powered with two Cooper-Bessemer JS-5 diesels driving 260 kw generators. These atmospheric engines, shown above, are still giving extremely low fuel consumption on 23 gravity diesel fuel oil. Each engine runs four days, continuously. Lube oil is removed, cleaned, and replaced in one engine during the alternate 4-day period. Both engines are occasionally operated at the same time during peak periods.

If you are looking for a completely dependable engine — with exceptional efficiency and unusually low fuel consumption under all loads — be sure to get complete information on Cooper-Bessemer gas-diesels, diesels, and gas engines.

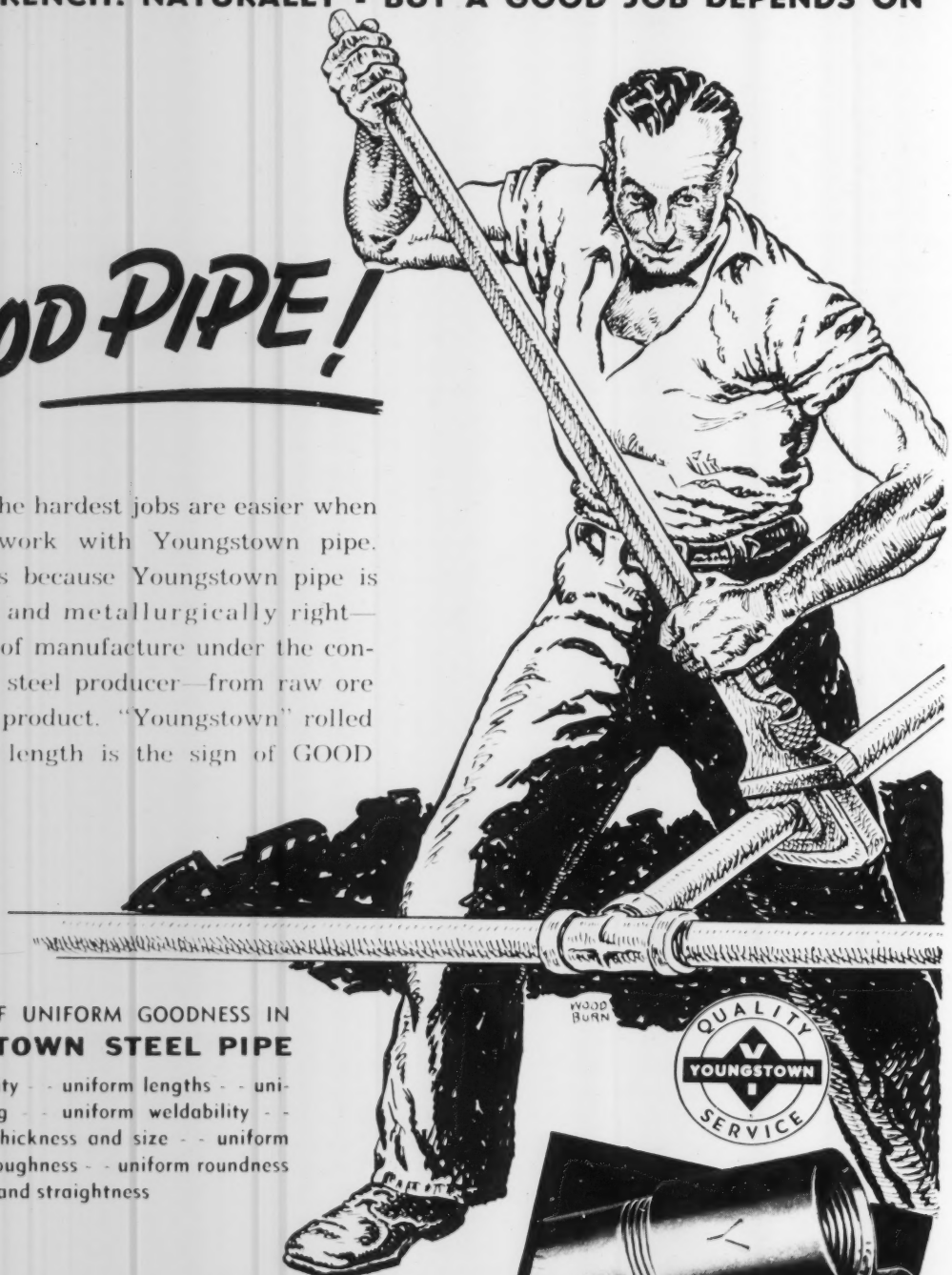
The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

GOOD WRENCH? NATURALLY - BUT A GOOD JOB DEPENDS ON

GOOD PIPE!



EVEN the hardest jobs are easier when you work with Youngstown pipe. That's because Youngstown pipe is chemically and metallurgically right—every step of manufacture under the control of one steel producer—from raw ore to finished product. "Youngstown" rolled into every length is the sign of GOOD PIPE.

7 POINTS OF UNIFORM GOODNESS IN
YOUNGSTOWN STEEL PIPE

uniform ductility - - uniform lengths - - uniform threading - - uniform weldability - - uniform wall thickness and size - - uniform strength and toughness - - uniform roundness and straightness

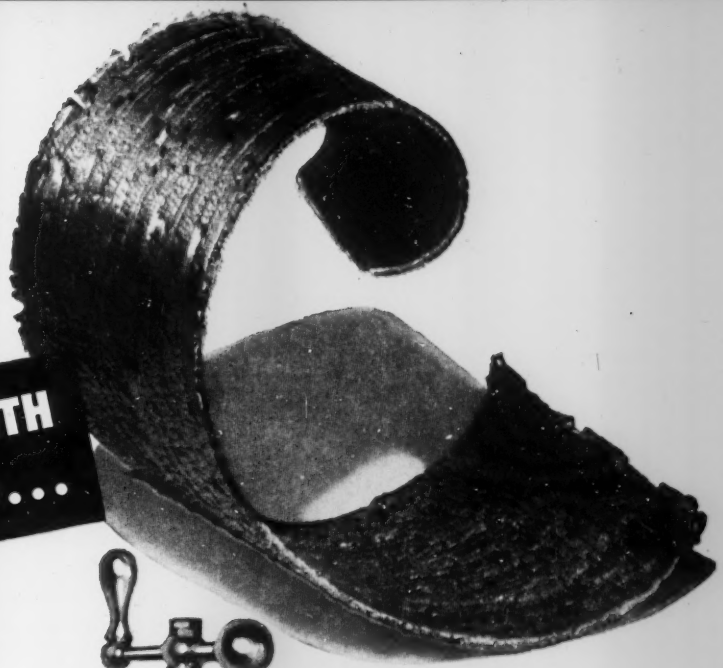
QUALITY YOUNGSTOWN SERVICE

Youngstown STEEL PIPE

THE YOUNGSTOWN SHEET AND TUBE COMPANY
General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.
PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES

50 lbs. oil pressure

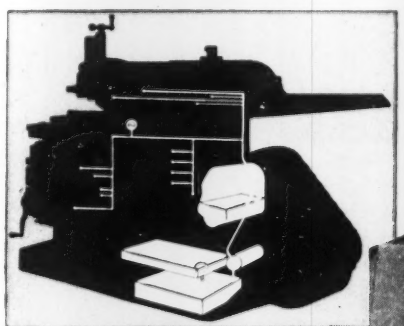
IS NECESSARY WITH A CUT LIKE THIS...



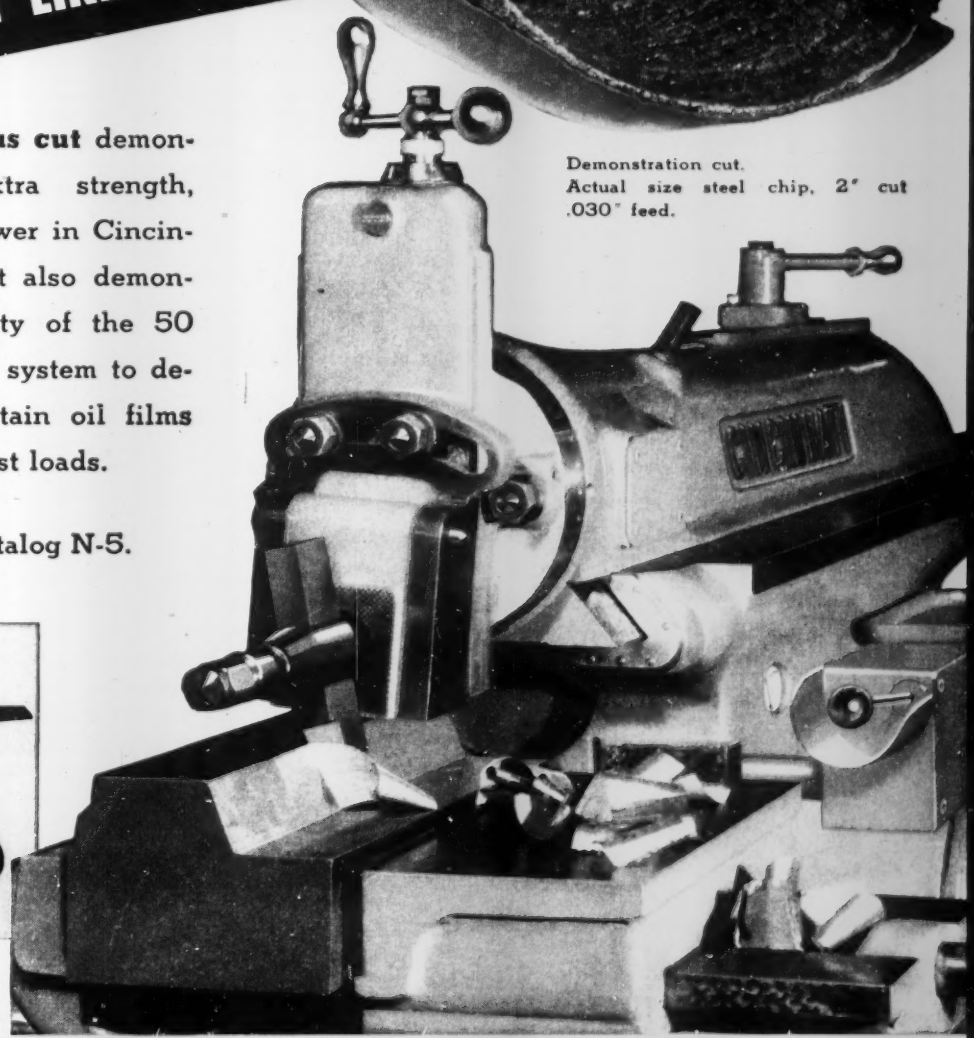
Demonstration cut.
Actual size steel chip, 2" cut .030" feed.

This tremendous cut demonstrates the extra strength, rigidity, and power in Cincinnati Shapers. It also demonstrates the ability of the 50 p.s.i. lubrication system to develop and maintain oil films under the heaviest loads.

Write for Catalog N-5.



50 p.s.i. system includes 50 micro filter, settling basin and reservoir. Transmission runs submerged in oil.



CINCINNATI

THE CINCINNATI SHAPER CO.

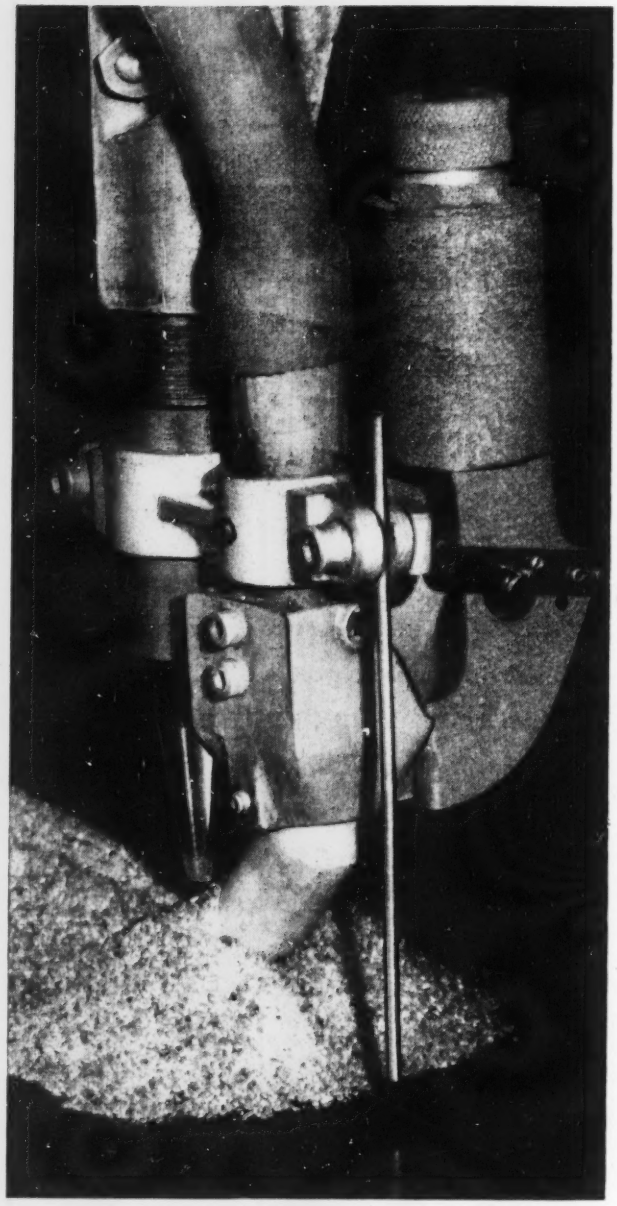
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

Two important parts of

UNIONMELT WELDING

Trade-Mark

You Can't See



This is UNIONMELT welding—instantly recognized by the special granulated material you see blanketing the weld. *You can't see* the powerful electric arc that fuses the metal beneath at the highest production rate attainable. No sparks or glare disrupt nearby plant activity.

You can't see the LINDE SERVICE that stands behind every UNIONMELT installation to assure its efficient and profitable operation. Only LINDE can give you this unique combination of research, engineering, and over 40 years of welding know-how that is helping LINDE customers save money and improve production. And only LINDE can give you the accumulated benefits of more than 18 continuous years of development, field testing, and improvement in the field of submerged melt welding where it pioneered.

LINDE's Service Engineers will gladly help you design a UNIONMELT installation to meet your exact requirements. They will also be available to help you when a tough production problem comes up. Call your nearest LINDE representative today.

Linde
TRADE-MARK

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The terms "Linde" and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

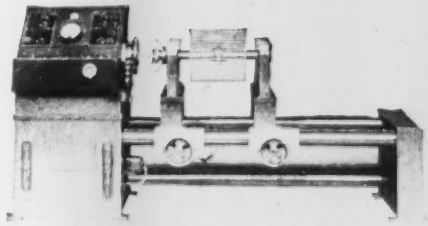
the final *check* for every rotating part...

Maybe it's a crankshaft or an armature . . . perhaps a fan or a belt pulley. No matter. The important thing is this: If it isn't *balanced,* it isn't ready for service.

Smooth operation and long life require that accurate static and dynamic balance be rated right along with mechanical specifications . . . incorporated in the blueprints. Then, no vibration, however slight, may lower the efficiency of the finished product.

Gisholt Balancing Machines can locate and measure unbalance vibrations down to .000025" with simple readings . . . handle any assembly from ½ ounce to 50 tons.

The cost? Very moderate. That's why so many manufacturers insist that their products have the final check which only Gisholt Balancing Machines can provide.



The Gisholt Type 3U Balancer shown here is capable of balancing rotating parts or assemblies weighing from 50 to 1000 pounds. Other sizes and types are available to answer any balancing problem. Gisholt Balancers can also be furnished with correction equipment to meet your own specific requirements.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

DYNETRIC BALANCERS GISHOLT

DEVELOPED JOINTLY WITH WESTINGHOUSE ELECTRIC CORPORATION
DYNETRIC IS A TRADE MARK REG. U. S. PAT. OFFICE BY WESTINGHOUSE ELECTRIC CORPORATION

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

What is it costing you NOT to replace your TURRET LATHES?

IT MAY be costing your company a great deal of money not to replace its old machine tools.

Here's what we mean—in dollars and cents. One company we know replaced two old turret lathes with one new Warner & Swasey No. 4 Universal. Output more than doubled and the company saved over $3,400 a year. Another company invested in a new 4-A Heavy Duty Warner & Swasey and reduced unit cost from $2.60 to $1.26 per piece.

These are but two examples. Our files are full of others.

The point, of course, is this: These savings might well be yours—savings through increased production which cuts costs—which in turn enables you to get and handle additional business.

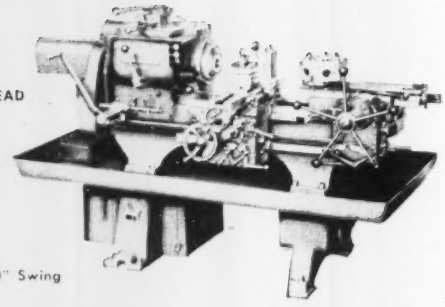
You may never know just how much it really *is* costing you not to replace, until you call in your turning specialist—your Warner & Swasey representative. He'll be glad to make a detailed analysis of your operation—show you how, by replacing old machine tools, you can increase your profits . . . substantially!

★ ★ ★

There is a proper size Warner & Swasey Turret Lathe to fill your turning needs, for it has always been a cornerstone of Warner & Swasey design to build an individual model for each range of work.

Whatever Warner & Swasey best fits *your* specific requirements, you'll get accuracy to meet your own exacting standards . . . fast production with minimum scrap loss . . . adaptability to scores of turning jobs.

RAM TYPE



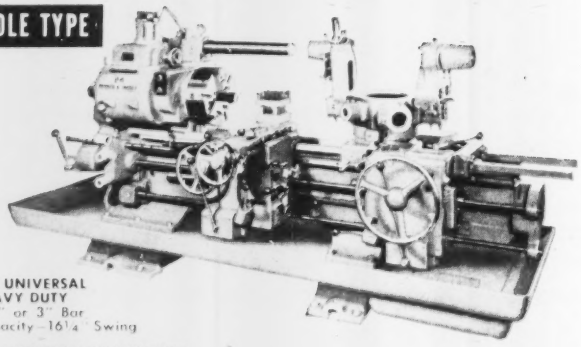
NO. 2 ALL-GEARED HEAD
1" Bar Capacity—
14" Swing

NO. 3 UNIVERSAL
1½" Bar Capacity—
15⅜" Swing

NO. 4 UNIVERSAL
2" Bar Capacity—
18⅛" Swing

NO. 5 UNIVERSAL
2½" Bar Capacity—20" Swing

SADDLE TYPE



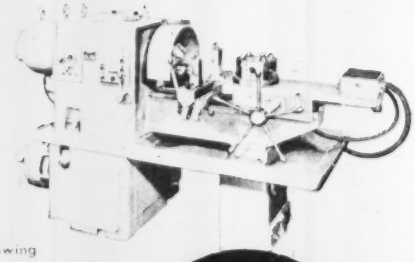
1-A UNIVERSAL HEAVY DUTY
2½" or 3" Bar Capacity—16¼" Swing

2-A UNIVERSAL HEAVY DUTY
3½" Bar Capacity—20" Swing

3-A UNIVERSAL HEAVY DUTY
4½" or 6" Bar Capacity—23½" Swing

4-A UNIVERSAL HEAVY DUTY
8", 9" or 12" Bar Capacity—28¼" Swing

ELECTRO-CYCLES



NO. 1 ELECTRO-CYCLE
⅝" Bar Capacity—
11" Swing

NO. 2 ELECTRO-CYCLE
1" Bar Capacity—
14" Swing

NO. 3 ELECTRO-CYCLE
1½" Bar Capacity—15⅜" Swing

16" ELECTRO-CYCLE
1½" Bar Capacity—
16⅞" Swing

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Here is perfection!

ROEBLING high carbon wire is unsurpassed for industry today. Roebling wire is absolutely true to specifications ... absolutely uniform in gauge and finish. Manufacturers who try Roebling wire once, become Roebling customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING CF

A subsidiary of The Colorado Fuel and Iron Corporation

The Jonker, world's largest emerald-cut diamond.

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 EMEDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 815 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5140 E. HANNUM ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Use the oil that gives BETTER PROTECTION

TEXACO REGAL OIL is your best bet for keeping roll stand circulating systems clean and bearings fully protected. This is because *Texaco Regal Oil* has notably high resistance to oxidation and sludging, and it separates easily from water.

Texaco Regal Oil assures that oil film bearings get an uninterrupted flow of clean, cooling lubricant . . . are protected by an oil film that stands up under heavy loads. Naturally, bearing life is increased and maintenance costs reduced.

For your enclosed reduction gears, use *Texaco Meropa Lubricant.* Its extreme pressure characteristics stand up in the severest service. It has high resistance to oxidation, thickening and foaming.

Let a Texaco Lubrication Engineer help you simplify and improve all your lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

STEEL
November 2, 1953

Metalworking Outlook

"New Look" in Weapons

Details are not available, but the Joint Chiefs of Staff has planned a "new look" for our defense equipment. The idea is to get modern weapons to keep us from becoming militarily obsolete. The proposals are being studied now by the National Security Council and the President and probably won't be revealed to much extent until Mr. Eisenhower sends the program to Congress in January. If approved, the plans will make many present production lines obsolete but will require many new ones to be created.

The Senator Speaks Up

Watch Sen. George Malone (Rep., Nev.). Making a stir is his Minerals, Materials & Fuels Economic subcommittee of the Senate Interior & Insular Affairs Committee which has been hearing some sensational testimony lately. The senator's position—and that of a good many of his witnesses—is that the U. S. should not allow itself to continue "the alarming dependence" on foreign sources for metals. He says that domestic mines, or at least mines in the Western Hemisphere, can produce all the strategic minerals the nation needs.

A Private AEC

Atomic Industrial Forum Inc. is bidding to become a kind of private Atomic Energy Commission. It's a nongovernment outfit designed to push for peaceful industrial development of the atom and to foster civilian research on the subject. Walker L. Cisler, president of Detroit Edison Co., is forum president, and Charles E. Robbins, formerly vice president of Bozell & Jacobs Inc., an advertising and public relations agency, is the recently appointed executive manager.

Still More Research

Look for peak expenditures by industry and the government on research in 1954—more than the $1.5 million to be spent by industry and the $2 billion to be spent by the U. S. on development work in 1953. The hunt for new civilian and war products will severely tax this nation's research facilities, so look for a marked increase there, too. At present, there are 3300 industrial laboratories, 60 university research branches, 12 nonprofit independent research institutes and 300 commercial and consulting laboratories that do testing and analytical work, as well as research. In addition to those, the U. S. supports 250 research laboratories.

Sign of the Times

The Chrysler deal to purchase Briggs, the rumors that Nash and Hudson will merge, the talk that General Motors will buy Willow Run—they all indicate that the auto industry is getting set for tougher competition ahead. The object is to keep earnings high through improved efficiency even if

The Technical Outlook—p. 89 The Market Outlook—p. 139

auto production slips in 1954. The thinking in the industry was summarized by R. C. Enos, president of Rockwell Spring & Axle Co., a major automotive supplier, when he said his company next year, despite declining sales, may do as well as this by eliminating overtime, getting better and lower priced materials from suppliers and otherwise improving efficiency.

Steel Homes in 1954

U. S. Steel Homes Inc., a U. S. Steel Corp. subsidiary, hopes to get into production on its new models about the first of the year. Each of the new steel units will use nearly eight tons of hot-rolled sheet. Built on a modular design and with interlocking panels, the sheets will have a special plastic finish. U. S. Steel counts on getting out 8000 houses in the first year.

More Buyer Resistance

There's more buyer resistance today than for years, says National Industrial Conference Board, which has just surveyed 155 manufacturers. Those companies report increased competition forces attention to: Accelerated recruiting and training of salesmen; the need for more aggressiveness in the sales force; development of new products and new markets for existing products; reduction of production and distribution costs; improved delivery and service; revamped distribution systems; more intensive market coverage; more dealer education and better finished goods stocks.

What Does It Cost?

How much is industrial relations administration costing you? American Management Association reports that the average cost per employee is $61.26 a year, compared to $48.59 in 1952. The expense is up because of higher salaries for staff members and greater expenses for telephone, travel, office supplies and overhead.

Straws in the Wind

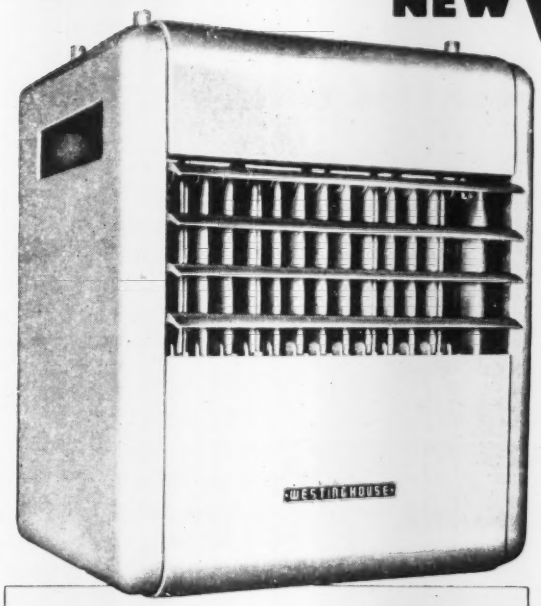
Newport News Shipbuilding & Dry Dock Co. will study the feasibility of nuclear power for ship propulsion . . . Sears, Roebuck & Co. has quietly dropped the Allstate car, its name for Kaiser Motors Corp.'s Henry J, which it had been marketing as an experiment in 17 cities . . . You can expect sales of plastic pipe this year to hit $20 million, compared to $500,000 in 1948 . . . Jones & Laughlin Steel Corp. cut output 9 per cent Nov. 1 because of "market conditions."

This Week in Metalworking

Buyers are in nearly complete control of steel, copper and aluminum inventories (p. 39) . . . Overtime is being cut down by metalworking plants (p. 41) . . . Steel companies' third-quarter earnings indicate that 1953 may well be a record year (p. 42) . . . The outlook for the gear business is good (p. 42) . . . If necessary, the nation's economy could support a heavier defense load than it now carries, reports National Planning Authority (p. 45) . . . Townsend Co. seeks to sell cold forming by means of industrial seminars (p. 50).

Now Available

NEW Westinghouse GAS-FIRED SPEEDHEATER®



For store, office, factory or warehouse, check these 8 Westinghouse features:

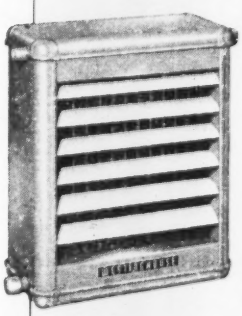
1. Instant on-the-spot HEAT
2. Automatic controls—no attendant needed
3. Ceiling suspension—uses no working space
4. No heat loss as in central plant piping
5. Swift, easy, economical installation; simple upkeep
6. Fully approved safety controls
7. Handsome, functional styling—no finishing cost
8. 7 sizes—25,000 to 200,000 BTU

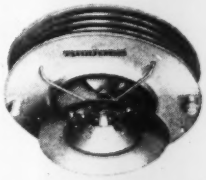
Heat starts right away—no long warm-up period. Self-contained, ceiling-mounted, the Westinghouse Gas-Fired Speedheater takes no valuable working space, needs no supervision, runs for low cost on natural, manufactured or LP gas. Adjustable louvres control distribution; fan will run separately for air circulation in summer. Get sure heat, save money on installation, avoid work, cut fuel bills—specify the new Westinghouse Gas-Fired Speedheater.

For full details on the Speedheater model best suited for you, call your nearest Westinghouse office for Catalogs 1521 and 1525, or write: Westinghouse Electric Corporation, Air Conditioning Division, Boston 36, Mass.

THE COMPLETE WESTINGHOUSE LINE

Meets Every Unit Heater Need





DOWNBLAST SPEEDHEATER

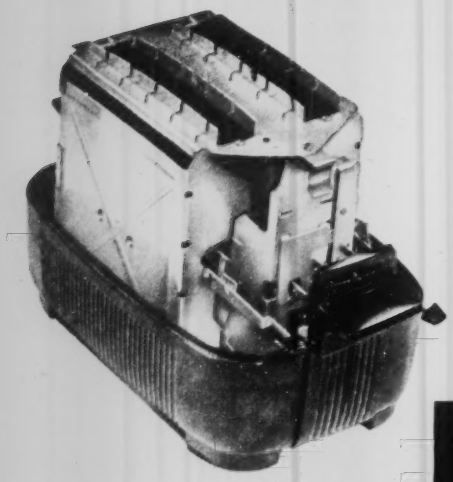
HORIZONTAL SPEEDHEATER

Get 7 times more output than conventional radiators; save money and space. In addition to the new Gas-Fired units, Westinghouse Speedheaters are available in 82 standard sizes in steam and hot water units. Capacities range from 25,000 to 400,000 BTU in horizontal and vertical models to meet every application.

WESTINGHOUSE AIR CONDITIONING

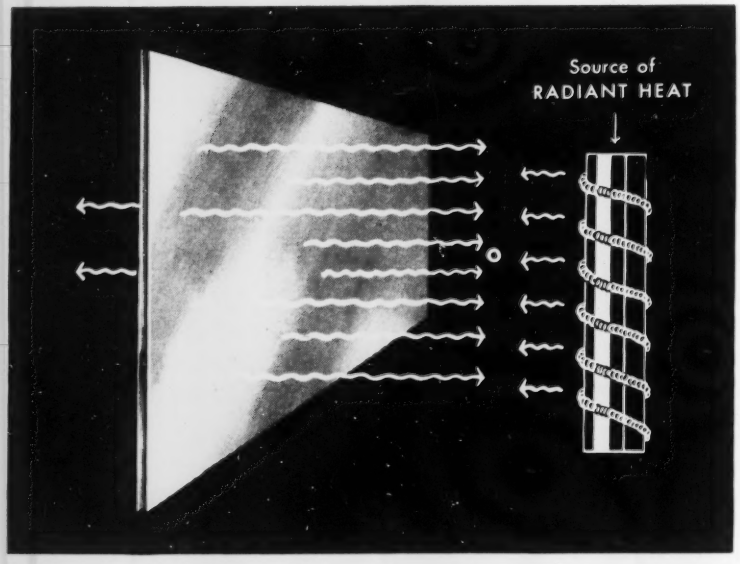
YOU CAN BE SURE...IF IT'S Westinghouse

J-80335



This ALUMINIZED Steel interior of a toaster keeps the inside hot, the outside cool.

This Steel STOPS Radiant Heat



Armco ALUMINIZED* Steel is an effective heat *barrier* because it is an excellent heat *reflector*. Up to about 900 F, it reflects more than 80 per cent of the radiant heat thrown against it. Less than 20 per cent goes through this hot-dip aluminum-coated steel. That's why it raises the heating efficiency of infra-red ovens, ranges and other gas and electric appliances. It *contains* rather than dissipates the radiant heat.

ENDURES SCALING TEMPERATURES

Besides serving as a reflector of heat, Armco ALUMINIZED Steel is widely used where high temperatures would cause other low-carbon steels to fail through progressive scaling. ALUMINIZED will withstand temperatures up to approximately 900 F without discoloration, and up to about 1250 F without destructive scaling.

For this reason a prominent independent research laboratory has rated Armco ALUMINIZED Steel next to stainless steel for endurance in combustion chambers and burner rings of gas-fired furnaces.

A FLAT-ROLLED PRODUCT

Armco ALUMINIZED Steel is made in sheets and coils 12 through 28 gage in thickness and up to 36 and 48 inches in width depending on gage. For more information on this versatile material, write for the booklet, "Armco ALUMINIZED Steel".

For other Armco products see our catalog in Sweet's Product Design File.

ARMCO STEEL CORPORATION

4463 CURTIS ST., MIDDLETOWN, O. • EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

® U. S. PATENT OFFICE

This Reform Can't Wait

Although this nation has been investing more than $20 billion annually in industrial plant and equipment, its productive facilities are not as up-to-date or efficient as many of us think. Authorities who ought to know say that our physical plant is inferior to that of Sweden or Switzerland.

The chief reason why our productive equipment is more obsolete than need be is that for 20 years our government has been pursuing a cockeyed policy on depreciation. Current tax depreciation regulations compel industry to spread the write-off of capital investment over a period much longer than the useful life of the equipment. Machinery & Allied Products Institute, which has devoted more thoroughgoing study to this problem than any other agency, says that industry is being forced to underdepreciate its equipment to the extent of $6 billion a year.

This means that American corporations in the aggregate are mistakenly labeling $6 billion as profit each year and are paying taxes on this fictitious profit at the rate of 52 per cent or more. The result is that industry is finding it increasingly difficult to finance badly needed new equipment. This was indicated during World War II and the Korean war when many companies did not have money to buy equipment for war work. Uncle Sam used tax money to purchase the needed facilities. As a result the government today owns 20 to 25 per cent of the nation's productive capacity.

This situation is so obviously desperate and yet so unnecessary that one wonders why something cannot be done about it. The answer is that to liberalize depreciation laws at this particular moment would aggravate an already touchy problem of tax revenue. The short-term loss in tax income appears to be formidable.

This point probably is being grossly exaggerated. If the 87.4 per cent of 2104 companies queried by our editors who say they would like to write off their equipment in 12 years or less, instead of the present average of 20.74 years, were permitted by tax regulations to do so, their improved position profitwise soon would wipe out any momentary dip in government tax revenue.

E. L. Shaner

EDITOR-IN-CHIEF

SEEK FIREPROOF ROOF: As a result of the disastrous General Motors transmission plant fire at Livonia, Mich., on Aug. 12 and of a less-publicized fire in the tank plant of Ford Motor Co. in Livonia about ten months previously, numerous authorities interested in

industrial safety have been devoting considerable study to the causes of fires such as those that occurred at Livonia.

Ford Motor Co. even went to the pains of erecting two test buildings to determine whether or not burning pitch from the roof is a major factor in plant fire damage. J. A. MacAlarney, Ford director of plant engineering, believes (p. 45) that the tests indicate clearly that the flames at the two Livonia fires were spread and fed by the vapor seal which consists of two plies of roofing felt mopped to the roof decking with asphalt pitch.

He expressed the hope that "roofing manufacturers will come up with a fireproof adhesive that won't fall into the building in droplets of flame like asphalt pitch does."

* * *

AUTOING IN MOSCOW: Writing in *The Atlantic Monthly* on the subject "Russia Assignment," Vice Adm. Leslie C. Stevens, USN (Ret.), relates experiences in Russia when he was attached to the American embassy in Moscow. Once, on a return from a hunting and fishing trip, he and his company ran out of gas. They finally induced a truck driver to give them 20 liters of benzine for a package of cigarets and 50 rubles. When this fuel was gone, they had to phone the embassy in Moscow to "come to meet us on the road with 50 liters more, for nowhere in Russia are there stations along the road where one can buy gas."

In current ads of the American Petroleum Institute appears a caption under a picture which reads: "Rare photograph shows Russian driver filling own gasoline tank at one of Moscow's five service stations." Another caption reads: "With only five filling stations for Moscow's five million inhabitants, cars must wait in line."

* * *

PEEK BEHIND CURTAIN: Meager facilities for servicing automobiles in Russia tie in nicely with numerous inconveniences and inadequacies reported by recent visitors to points beyond the Iron Curtain. A dozen or so American college students returned from the USSR with hundreds of photographs showing the low standard of living. Shortly before their visit, a small group of small-city newspaper editors toured parts of Russia and came back with similar reports. Pearl Mesta's accounts of her amazing visit confirm what others have reported.

We of the western nations may well wonder why the Kremlin apparently is permitting more people from the free nations of the world to peek a bit more freely at what is going on behind the curtain. Can it be that the new regime really will try hard to provide more consumer goods and a better standard of living for the people as it has been promising recently?

* * *

MORE FOR THE PEOPLE: During World War II, Stalin told several members of our War Production Board that as soon as the war was over whoever was at the head of the Russian government would have to provide a much better standard of living for the people in payment for their great sacrifices. This promise never was kept by Stalin. Perhaps his successor sees the need. Quite likely he is seeing it even more clearly since the uprisings in Eastern Europe in September.

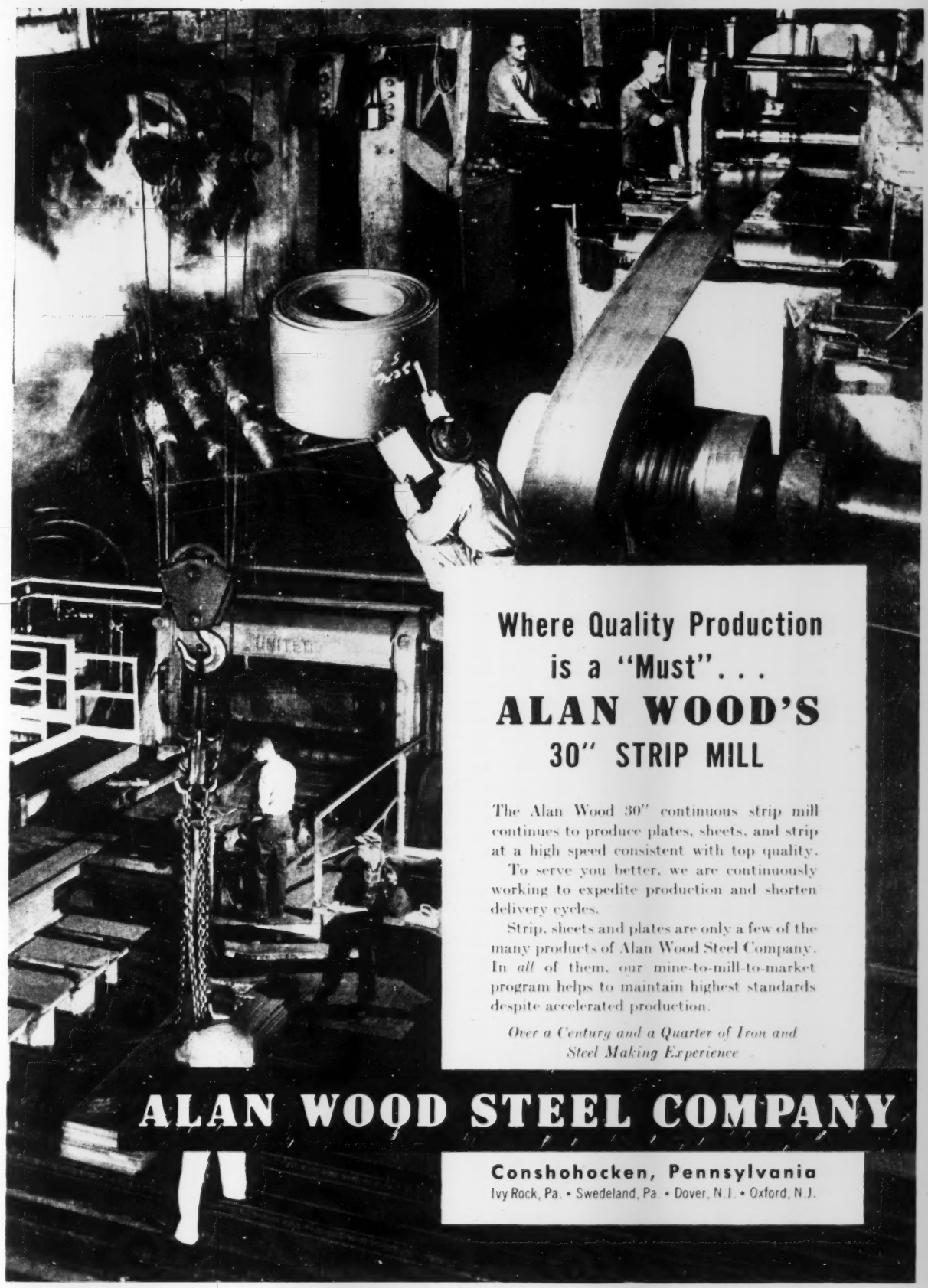
At any rate, if the Kremlin belatedly is determined to do something for the people, a discreet lifting of the Iron Curtain will give the outside world a chance to see something new in the USSR—a real improvement in the well being of the masses. Can that be why the curtain is not so tight?

* * *

DISPENSING OVERTIME: Now that the pressure on production in the metalworking industry is easing, there is bound to be trouble arising from a drastic reduction in the amount of overtime work. Eliminating time-and-a-half and double-time affords attractive opportunities in reducing the cost of manufacture.

How smoothly overtime can be trimmed (p. 41) depends to a considerable extent upon a company's foremen. Every foreman knows that certain of his men welcome overtime. Others shun it like poison. If the foreman has been smart he has been dealing out overtime liberally and equitably to those who want it and imposing it fairly and in turn to those who don't want it.

The foreman who handled overtime fairly when it was a headache will be in a position to dole it out advantageously when it is a favor.



Where Quality Production is a "Must"...

ALAN WOOD'S

30" STRIP MILL

The Alan Wood 30" continuous strip mill continues to produce plates, sheets, and strip at a high speed consistent with top quality.

To serve you better, we are continuously working to expedite production and shorten delivery cycles.

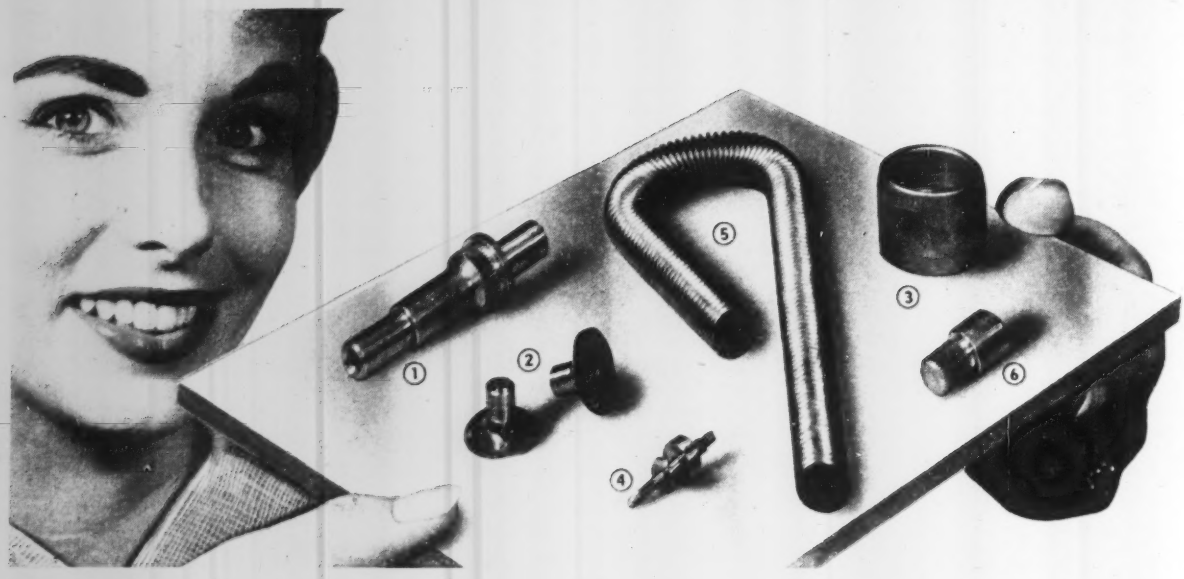
Strip, sheets and plates are only a few of the many products of Alan Wood Steel Company. In *all* of them, our mine-to-mill-to-market program helps to maintain highest standards despite accelerated production.

Over a Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

Conshohocken, Pennsylvania

Ivy Rock, Pa. • Swedeland, Pa. • Dover, N.J. • Oxford, N.J.



Lead Lubricating Steel

increases production 43%

It is almost too good to be true—but, in Ledloy, lead actually lubricates the steel during machining, permitting greatly increased feeds and speeds. On job after job in shops throughout the country Ledloy is effecting net savings of 25% or more because it machines 30% to 50% faster than B-1113 and extends tool life as much as 200%.

The lead in this remarkable open hearth steel is so finely dispersed it cannot be seen with a microscope. Yet it reduces the friction between chip and cutting tool substantially. And Ledloy machines to an unusually clean smooth finish—case hardens effectively—bends, crimps, swedges or rivets easily.

Your nearby Ryerson plant now has large stocks of Ledloy rounds, squares and hexagons in a wide range of sizes. So get all the facts from your Ryerson representative or write for engineering data on Ledloy. And call Ryerson for quick shipment of this remarkable new free-machining steel.

How Ledloy Cut Costs on These Parts

1. ***BEATER SHAFT**—production increased 43% when shop switched to Ledloy from C-1117. Part is case hardened to 60-62 Rockwell C.
2. ***GOLF SHOE LUGS**—Ledloy succeeded where free-cutting Bessemer steels failed in this swedging operation. Took inside threads perfectly.
3. ***UNIVERSAL JOINT SOCKET**—formerly made from C-1117, production rose 72% with Ledloy. Part is case hardened to 60-62 Rockwell C.
4. ***DRIVE SHAFT**—result of changing from B-1113 to Ledloy: production increased more than 35%, over-all costs decreased 20%.
5. ***THREADED BAR**—the excellent cold-bending properties of Ledloy important here. Notice clear definition of thread and fine finish.
6. ***KNURLED STUD**—B-1113 originally used. Use of Ledloy resulted in 19.9% reduction in over-all costs, 54% increased in production.

*Company name and more detailed figures on request.

Principal Products: Carbon, Alloy & Stainless Steels—Bars, Structurals, Plates, Sheets, Tubing, Machinery & Tools, Etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Buyers Expect To Reduce Stocks

Faster deliveries have enabled buyers to expand their stocks seasonally, but future prospects call for the maintenance of lower inventory levels

BUYERS ARE in almost complete control of their steel, copper and aluminum inventories.

That's indicated by two facts: The table on page 40 shows that purchasers are expanding their stocks this quarter in a seasonal move which in times of metal shortages would have been impossible; also, 79 per cent of the respondents to STEEL's survey say they expect to reduce inventories next quarter.

Speed—The replies to the quarterly check cite faster deliveries for all but three metal products—structural shapes, welded tubing and foundry pig iron. Structural shapes are actually harder to obtain than the table indicates, for many purchasers say that it takes longer than six months for their orders to be filled.

Inventories of all but six items have been moderately enlarged. Stocks of cold-finished bars over one inch, hot-rolled carbon bars, galvanized sheets, seamless tubing and stainless sheets and strip have been reduced.

Obtainable Ideal?—The ideal inventory position remains 30 to 60 days for most products. Though many purchasers are already in this bracket, many more desire to be included.

Although inventories have been expanded in the past quarter, this action was given careful consideration. Future activity will also be watched as closely. That's indicated by the buying attitude of purchasers. Now only 5 per cent of them are buying as much as they can without regard to inventory position. The other 95 per cent are following economic developments closely.

Less From Warehouses — The use of warehouse sources for metal supplies continues to decline as deliveries improve. Ninety per cent of the purchasers expect further improvement in deliveries during the next three months and only 22 per cent of them are using warehouse sources more now than before the Korean war.

Only 5 per cent of the purchasers are using any conversion or foreign sources of supply.

Purchasing agents are able to face the future confidently as far as their supplies are concerned. Although metal users foresee a slight downturn in business, they are prepared for whatever comes

Balance in the Northwest

Shapes, rod, wire and cable will be produced in Alcoa's new fabricating mills

ALUMINUM Co. of America is rushing expansion of fabricating facilities at its Vancouver, Wash., plant.

Object: Better integration with Alcoa's annual production capacity of 340 million pounds of primary aluminum in the Pacific Northwest.

Under construction are fabricating-ingot casting facilities, rod, wire and cable mill additions and a new extrusion mill situated on the north bank of the Columbia river, about 3 miles down river from Vancouver, B. C. Total cost of the three-way expansion should be about $6.7 million.

By Next Summer—The $3,360,000 extrusion mill, largest single item on the construction agenda, should be ready to turn out extruded aluminum shapes sometime next summer. Two 2500-ton extrusion presses will be installed, capable of processing monthly up to 3 million pounds of aluminum alloy blooms for further fabrication into rod, wire and bar. They also will be used to fabricate common and strong aluminum alloys into extruded shapes for the Pacific Northwest market.

The rod, wire and cable mill addition, set for completion in early 1954, will expand facilities to produce aluminum cable, steel reinforced (ACSR), a completely fabricated, finished product used extensively for the transmission of electric power, much of it high voltage.

Powerful Contract — A $4-mil-

Latest Metal Supply Picture as Seen by STEEL's Quarterly Survey

(Figures are percentages of those replying to the questionnaire)

COMPONENTS	INVENTORY POSITION					BEST DELIVERY				
	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days	Under 10 Days	10-30 Days	30-60 Days	60-90 Days	90-180 Days
C. F. bars, over 1" (This quarter)		31	39	15	15	20	50	10		20
(Last quarter)		31	37	21	11	23	18	35	12	12
C. F. bars, under 1"		42	33	25		27	37	27	9	
		23	59	12	6	14	43	14	29	
H. R. alloy bars			33	45	22	13	26	12	37	12
		8	38	46	8	16	25	17	17	25
H. R. carbon bars, over 1"		23	54	9	14	32	27	27	9	5
	3	30	33	24	10	20	32	8	16	24
H. R. carbon bars, under 1"		19	54	23	4	17	35	31	13	4
	3	19	45	26	7	17	40	10	20	13
H. R. sheets, strip		30	25	30	15	10	20	40	25	5
	1	21	50	17	8	8	19	11	31	31
C. R. sheets, strip		7	57	36			7	40	53	
		32	12	26		12	12	6	29	41
Galvanized sheets		43	29	14	14	29	14	57		
		11	45	33	11	12	13		38	37
Plates, light		24	17	23	6	19	38	25	12	6
		35	39	13	13	9	30	30	9	22
Plates, heavy		21	43	29	7	9	8	58	17	8
		22	61	11	6	11	17	33	6	33
Structural shapes	6	19	50	25		6	25	19	25	25
	5	10	30	20	5	10	10	30	20	30
Welded tubing			67	22	11	15	14	57	14	
		30	50		20	27	18	46	9	
Seamless tubing	13	38	25	12	12	50		17	33	
		13	36	7	14	13	33	27	20	7
Stainless sheets, strip	9	18	55	18			46	18	36	
	12	13	50		25	10	30	10	20	30
Pig iron (foundry)			50	38	12		57	29	14	
		12	63	25		11	67	11	11	
Copper, brass mill prod.		25	50	13	12	11	15	33	11	
		31	46	8	15	18	18	37	18	9
Aluminum products		18	37	36	9	18	28	27	27	
	13	13	47	20	7	15	31	15	39	

lion contract for 1327 miles of 1.6-inch diameter ACSR recently was awarded Alcoa by the Bonneville Power Administration. The cable, with 84 aluminum strands over a 19-strand steel core, will be fabricated in large part in the new cable mill addition. The present rod, wire and cable mill produced more than 41 million pounds of electrical conductor cable and rod in 1952.

Increased ingot casting facilities, which at present are already turning out extrusion ingots and experimental sheet ingots, will handle about 6 million pounds of aluminum each month. Thousand-pound extrusion ingots now being shipped to Alcoa's Vernon, Calif., plant will be fabricated into extruded shapes at Vancouver on completion of the extrusion mill some time in 1954.

Weighty Additions—Over 50 per cent of the aluminum at the Vancouver plant is already further processed there today. And the three-pronged expansion program will add a million pounds a month fabricated by the extrusion mill and two million pounds a month in the rod, wire and cable mill addition.

Great Lakes Starts New Mill

An improvement in service to customers of Great Lakes Steel Corp., Detroit, became available two months ahead of the company's schedule.

Key to this improvement is a new universal slabbing mill that went into operation this week instead of beginning of next year.

By providing slabs weighing 7½ to 8 tons for rerolling on the company's continuous strip mill the new mill will enable Great Lakes to ship cold-rolled steel coils in widths of 61½ to 73 inches and weighing 7 to 8 tons without a weld, or 14-16 tons with one weld.

Before the new slabbing mill went into operation, cold-rolled steel in those widths was produced from a 2½-ton slab, and three welds were required to produce an 8-ton coil and five welds to make a 12-ton coil.

"This," says J. E. Fink, vice president in charge of operations at Great Lakes, "will prove to be a big advantage to our customers in the automotive industry because small coils and many welds slow

down and interfere with their production."

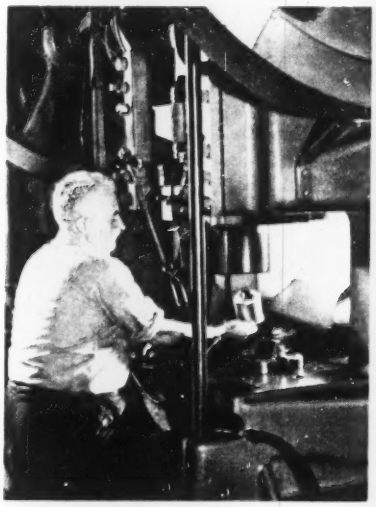
One feature of the new slabbing mill is an automatic scarfing machine which surface conditions both the top and bottom of the slab before it is rolled into hot bands for the company's cold-reducing mills.

By Dec. 1, the company's maximum capacity of 4 million tons of ingots will be available—one month ahead of schedule. On that date, the company's production of finished products will be at an annual rate of 2 million tons of cold-rolled steel and 1 million tons of hot-rolled.

Great Lakes Steel, a subsidiary of National Steel Corp., is a major producer of flat-rolled steel, going largely to the automobile industry.

Rem-Cru Plans Titanium Boost

Titanium production by Rem-Cru Titanium Inc., Midland, Pa., will be stepped up 300 per cent during the first half of 1954. Jointly owned by the Remington Arms Co. Inc. and the Crucible Steel Co. of America, the company will be turning out 10 ingot-tons daily of titanium in finished form as plate, sheet, strip and bars early in 1954.



Taming Titanium

Experiments in deep drawing commercially pure titanium sheet using dies originally designed for drawing steel is meeting with considerable success, engineers at Worcester Pressed Steel Co., Worcester, Mass., report. The company is doing development work on titanium primer cups for ammunition

Overtime: More Reductions Coming

So far the average workweek has not shrunk drastically, but manufacturers are preparing for the time when it will. Overtime is marked as the first thing to go in cost reduction

OVERTIME stands squarely in the path of a moving steam roller called cost reduction.

Does this bring new problems to management? "Yes, overtime is a real problem with us," says one steel company executive. "We want to cut labor costs, but when we cut down overtime, we get complaints from the workers. We had a strike earlier this year when we tried it."

Not Now—The problem is one for the future in many metalworking plants, however. Overtime hasn't been flattened. Though the over-all trend is down, it's gradual; there has been no collapse. Plants doing civilian work have put great emphasis on reduction of overtime. But, in many cases, rush orders or market conditions have sustained workweeks. Defense producers are getting increasingly cost conscious, too. Schedules based on defense contracts which make no provision for overtime costs are being re-examined so that unhurried defense shipments do not interfere with pressing civilian shipments. All that has not greatly reduced the average workweek in metalworking plants.

Commerce department figures on average weekly hours per worker in durable goods manufacturing industries bear out the above appraisal as they show a less than seasonal upturn in August. But the slack is so small it can hardly be called a trend:

1946-1948 Average	1952 Average	1953 August
40.4	41.5	41.1

Crosscurrent—A bit of counterpoint to the overtime theme is that employers are generally willing to hire more people for regular shifts than pay overtime for one shift or a short shift. That's particularly true in the aircraft, electronics and radar equipment industries. Commerce department figures bear out such an appraisal in reports on the number of production workers in durable goods manufacturing industries:

1946-1948 Average	1952 Average	1953 August
6,774,000	7,181,000	8,029,000

At the same time unemployment hovers around record lows at 1,240,000 persons in August, 1953, up only slightly to 1,246,000 persons in September, 1953.

Proof Positive—When the time does come for drastic reduction of overtime, it will be the proving period for employer-employee communications. Companies which have experienced the least amount of friction in overtime cutbacks thus far are those which kept employees informed of the company's competitive position and business outlook. "We have no real pressure for continued overtime here. Our employees understand that since we are a jobbing shop, we are frequently subject to declines in orders," says the vice president of a small metalworking company.

Unions ostensibly are interested mainly in seeing that overtime, or lack of it, is passed around equally among employees who might be affected. Here the burden falls heavily on the foremen and supervisory personnel. These foremen and supervisors should be alerted to distributing whatever overtime is available in the most equitable manner possible.

Not Too Late—The groundwork for minimizing the loss of overtime pay should already have been laid among the employees, of course. But it's not too late yet to begin apprising workers on your company's policy and position in the matter.

The important thing is to have the confidence of this metalworking president, who told STEEL: "We believe our workers know enough about our business conditions to know the reason for overtime cuts and will take them in their stride."

Steel Income Remains High

Third-quarter shipments slip, but nine-month totals show 1953 may hit sales record

U. S. STEEL CORP., nation's largest steelmaker, reported its largest third-quarter activity in 37 years last week; earnings totaled $61.7-million and shipments were 6 million tons for the period. Although the third quarter was a record in itself, steel shipments by most producers were down slightly from the second quarter.

U. S. Steel's earnings for the first nine months of 1953 were $166.7 million, equal to $5.66 a common share.

J. & L.—Jones & Laughlin Steel Corp. reported its third-quarter income as $8.8 million, bringing its nine-month earnings for this year to $25 million, equal to $3.88 a common share.

Sharon Steel Corp. had a net income of nearly $5.8 million, equal to $5.26 a common share for the first nine months. Third-quarter income was over $1.6 million.

Electrics Down—Allegheny Ludlum Steel Corp.'s earnings for the first nine months amounted to $6.3-million or $3.64 per common stock share. Officials state that third-quarter sales of $58 million were down from the first and second quarters of the year due to a decline in demand for electric furnace carbon steel ingots and slabs.

Alan Wood Steel Co. reports an income of $900,567 for the third quarter this year which brings its nine-months total earnings to $2.4-million, equal to $3.59 per common share.

Three Per Cent—Inland Steel Co.'s first nine-month earnings for 1953 amounted to $24 million, equal to $4.91 per share common stock. Third-quarter sales of $149.7 million were down 3 per cent over the second quarter and income for this period was $8.3-million.

Acme Steel Co. reported third-quarter earnings over $1 million, bringing the total for the first nine months to $3.6 million. Third-quarter sales of $18 million were down $2 million from the previous quarter.

Manufacturers' Profits Up—Before and After Taxes

(millions of dollars)

Industry Group	Profits before taxes 1st Q 1953	2nd Q 1953	Per cent change	Profits after taxes 1st Q 1953	2nd Q 1953	Per cent change
Primary nonferrous metals	260	278	+ 7	127	124	− 2
Primary iron and steel	585	696	+ 19	228	243	+ 7
Fabricated metal	286	320	+ 12	118	140	+ 19
Machinery (excl. elec.)	644	721	+ 12	262	278	+ 6
Electrical machinery	526	507	− 4	194	165	− 15
Transportation equipment (excl. auto.)	196	248	+ 27	69	85	+ 23
Motor vehicles and parts	857	907	+ 6	269	272	+ 1
Instruments, etc.	115	132	+ 15	44	48	+ 9
Miscellaneous	73	86	+ 18	35	38	+ 9
All manufacturing	6614	7119	+ 8	2847	3031	+ 6

Note: Figures are rounded and will not necessarily add to totals.

MANUFACTURING corporations' profits after taxes grew 6 per cent to an estimated $3 billion in the second quarter, 1953, from the first quarter, 1953, says the Securities & Exchange Commission and the Federal Trade Commission with the latest figures available.

Profits before and after taxes were higher than in any quarter since the second quarter, 1951. Second-quarter profits before taxes rose 8 per cent to $68.7 billion from $66 billion in the first quarter this year.

Little Companies Best — The smallest-size groups of corporations showed the largest relative increases in rates of profit. The profit rates for the largest-size group also increased somewhat while the medium-sized groups showed small decreases in most instances.

Among the more important groups showing increases were transportation equipment (other than automobiles) manufacturers and fabricated metal products makers. Electrical machinery, textile mill products and apparel groups showed moderate declines in profits after taxes.

To see how metalworking groups stacked up against the average 6 and 8-per-cent increases in profits for all manufacturing corporations see the chart above.

Better Business Ahead

Competitive business conditions cause gearmakers to revise their 1954 sales outlook upward

GEARMAKERS now expect 1954 business to be stronger than was expected several months ago. While many expect soft spots to develop, the over-all expectation is for a high-level volume. Some expect their volume will equal or exceed that of 1953.

Substantiating these expectations, expressed in conversations at the American Gear Manufacturers Association semiannual meeting in Chicago Oct. 25-28, is a rise of 11.5 points in the association's index of shipments for September.

Civilians To Retool—Part of the optimism is attributed to the need by manufacturers of civilian goods to retool for new models. As the economy returns to a truly competitive basis automotive and other durable consumer goods producers are paying more attention to the designs and values they offer their customers. One factor particularly affecting gearmakers is the increasing use of automatic transmissions in motor vehicles.

Recognition that the more competitive economy ahead will require increased efficiency was evidenced by the fact that AGMA devoted its nontechnical session to the problem of scientific management training.

One Plan—Westinghouse Elec-

tric Corp.'s management development program was outlined by George H. McBride, assistant manager of that company's switchgear division. The year-old program now affects 5000 individuals. It includes educational refresher courses, on-the-job guidance, job rotation and conference training.

A. H. Candee, gear consultant and formerly with the Gleason Works, was elected an honorary life member of AGMA for his 26 years of service to the industry.

AGMA will move its headquarters from Pittsburgh to Washington next spring.

GM: Parson with a Freight Car

General Motors Corp.'s new "piggy-back" freight car for carrying trucks places it in the position of a parson trying to marry a Martin and a Coy. But if the marriage catches on GM stands to win a hero's laurels from the trucking and railroad industries as well as the public.

After two years of study, GM's Electro-Motive Division has come up with a new flat car 75 feet long and 9½ feet wide for carrying two big semitrailers at one time. GM figures the car is a natural and reports plenty of interest after showing films of what the car will do to both railroad and trucking officials.

The interest is understandable. Railroads are suffering from reduced business. Truckers are having their own revenue problems.

The new depressed flat car can be side-loaded with the two truck trailers in less than five minutes in a special lowered-track terminal. Load limit on the car is 130,000 pounds. GM's proposal is to have loading and unloading terminals at the limits of each city. Trucks will carry the trailers within the city and the railroads will carry the trailers between cities. Officials believe that the combined rail-truck operation can provide cheaper and faster service than the present truck system.

The new car development took place primarily at E-M's Cleveland plant and officials report that when the orders start rolling in production will probably be in Cleveland.

TRANSISTORS:

THE BETS REMAIN HIGH

IF TRANSISTORS were likened to a race horse, their status would be something like this: They are off to a very fast start. They haven't hit the home stretch yet, but they're going strong and are a cinch to finish in the money.

That's the report of top officials in the transistor business. And they're backing up their "entry" to the tune of millions of dollars in research.

Patience, Please—Most officials blame "unfortunate publicity too early" for the current belief in many circles that transistors are proving to be a disappointment. "We've made more rapid development than most persons can conceive," relates one researcher. "When transistors were first announced five years ago, people were completely enthralled with the idea and immediately expected miracles from cleaning house to cooking. It's just not that fast, but we are at about the same point that vacuum tubes were ten years ago."

Transistors today are being used in hearing aids and for switching operations in telephones and to a certain degree in radio and television set parts. Most units are of the three-element type; Sylvania two months ago introduced four and five-elements into the transistor market.

Aid, Not Replace—Few expect the transistor to replace completely the vacuum tube. The experts state that transistors will undoubtedly replace them in certain applications; but that with the completely new fields that are expected to be opened by transistors, actual use of vacuum tubes will be broadened.

Which directions these "new fields" will take, the industry is not yet ready to say. One of the problems has been developing a transistor which will operate on higher power—most success to date has been in the very low-power range.

Possibilities — Stephen Angelo, materials engineering department at Westinghouse Electric Corp., Pittsburgh, says, "As soon as the power comes up, transistors can be used in motor control circuits in switches. We have another development in connection with magnetic amplifiers."

Computers, too, are often mentioned by the research men as a potentially big market in the future of transistors. Their use ranges from the business machine computer to steel mill machinery adaptations.

In Two Years—Auto and portable radios offer another promising field in the near future, according to James J. Sutherland, general manager of Sylvania Electric Products Inc. Electronics Division plant at Woburn, Mass. "We've built these radios using all transistors and no vacuum tubes," he relates, "and we feel that there'll be a big market in this field, probably coming in 1955 and 1956."

Then there are military applications. Practically all companies contacted by STEEL reported military activity, but it's all secret.

Only the Beginning—Approximately 15 companies are working on the development of transistors and applications for their use. Most readily admit technical and production shortcomings. But they are quick to point out that the race just started and you'd better not tear up your ticket.

From Jets to Refrigerators

Hotpoint converts its Chicago refrigerator plant to civilian production

HOTPOINT CO., Chicago, will make its own refrigerators for 1954 because the Navy canceled a contract for jet engine components.

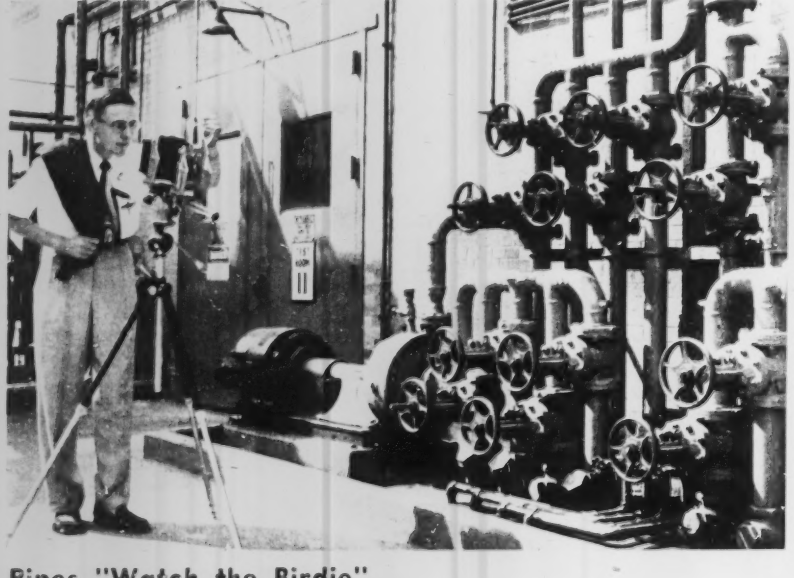
Several years ago Hotpoint decided to make its own line of refrigerators and built a new plant for that production in Chicago. Before the first refrigerator came off the line, however, the Korean hostilities broke out, and Hotpoint converted the plant to manufacture jet engine components. Early this year the jet engine component contract was formally terminated, and Hotpoint retooled the Chicago plant in about 12 months for its original purpose of making refrigerators.

A full line of 1954-model refrigerators is now going into large-scale production and will be available for shipments to dealers by the first of the year.

Centralized — The multimillion dollar plant has manufacturing floor space of about 1 million square feet and a capacity of more than 400,000 refrigerators a year. Nearly ten miles of overhead conveyors are used in what Hotpoint calls "mass production techniques never before possible in the manufacture of refrigerators." Fabrication lines of doors, cabinets and liners are laid out on a north to south line, one for each unit, allowing Hotpoint to make each major part of the refrigerator in an in-line progressive manner. Conveyors carry components to final assembly lines.

In the Chicago area, Hotpoint now makes refrigerators, ranges and automatic washers and dryers. Enough dishwashers and hot water heaters, made in Milwaukee, will be brought down to Chicago to enable the company to ship mixed carloads of these appliances.

Men Wanted—The refrigerator plant will employ about 1500 persons when in full production, and Hotpoint currently is looking for approximately 1000 additional workers. This is one more proof that loss of defense work does not necessarily mean unemployment.



Pipes "Watch the Birdie"

Photography can be used to simplify maintenance and repair work. Proof of that statement comes from Thompson Products Inc., Cleveland, where engineers say photographs of complex piping installations, taken during the course of construction, may save dozens of man-hours later when repairs become necessary. Multiple-angle shots provide three-dimensional relationships, often misunderstood in blueprints or drawings. Inexpensive camera equipment can be used

More for the Money

The Army's improving its combat readiness even on slimmer budgets, the NTDMA is told

ARE DEFENSE PLANNERS wrecking the Army by cutting expenditures too far?

An unqualified "no" comes from John Slezak, assistant secretary of the army for materiel. "We are maintaining and in some cases even improving our combat readiness," he told members of the National Tool & Die Manufacturers' Association, meeting in Asbury Park, N. J., last week. "For too many years we have been deluded into thinking that merely spending large sums of money alone would buy us defense readiness."

Slowing Down?—Storing of productive equipment under new defense policy won't mean buying of machinery or tools will stop, said Mr. Slezak, former president, Turner Brass Works, Sycamore, Ill. It's slowing down considerably though, some tool and die men feel.

While the Defense department has a $250-million appropriation for improving the production base and the Army has nearly $400 million for expansion of production facilities, little of this money will go into tools and dies. "Improvement of equipment makes old dies obsolete," said Mr. Slezak. "It seems a poor use of money to tool up on items that have frequent engineering changes."

Still a Market—The Army is not about to stop buying tools and dies though. They will be needed in special tooling to meet current needs.

Continued good business in 1954 for the 2500-3000 contract tool and die shops was forecast at the meeting.

New officers of NTDMA: President, Herbert C. Murrer of Murrer Tool Co., Cincinnati; first vice president, Jerome H. Stanek of Stanek Tool & Mfg. Co., Milwaukee; second vice president, Joseph N. Huser of B & H Specialty Co., Indianapolis; secretary, Albert Goldman of Atlantic Mfg. Co., Philadelphia, and treasurer, Philip R. Marsilius of Producto Machine Co., Bridgeport, Conn.

Resounding "Yes"

That's National Planning Association's answer to whether U. S. can spend more for defense

CAN THE U.S. afford a larger defense program than currently projected and still avoid the pitfalls of a "guns and butter" economy?

The National Planning Association undertook a study of that question and came up with a resounding "yes." Defense spending could rise, not fall, to an annual rate of $70 billion to $75 billion without necessitating wartime controls.

Keep Out—The pitfalls to be avoided, says NPA, are: 1. An increase in taxes to, or beyond, the point where they stifle incentives; 2. Imposition of direct controls on consumption, output, prices and wages; 3. Permitting disrupting inflation to occur.

To ascertain how much more the U.S. could afford to spend on defense, the NPA made three hypothetical additions to present national security spending which is scheduled to decline from the $53-billion annual rate now to a $42-billion annual rate by 1956. Here is what NPA economists found in each case:

$52 Billion Program—An additional program of $10 billion annually by 1956 would not interfere with further business expansion and would not prevent a continuing increase in the standard of living.

$62 Billion Program—A program of $20 billion annually in added defense spending by 1956 would mean an increase in the total amount of each spending above present peak levels. Taxes would have to be continued at 1953 levels.

$75 Billion Program — A program of $33 billion annually in added defense spending would raise considerably the ratio of defense output to total production. It would leave resources only for small increases in investments and the standard of living. It would require an increase in taxes, too.

The NPA study does not urge that the U.S. *should* increase national security spending but states the U.S. *could* increase such spending without harm.

This blaze tests roof construction methods as . . .

Ford Plays with Fire To Build Safer Plants

ASPHALT pitch vapor seals will be abandoned in future Ford Motor Co. plants if recommendations based on a unique fire test are followed.

Prompted by fire damage at the Ford tank plant a year ago and the General Motors plant, both in Livonia, engineers set up an elaborate pair of duplicate buildings to test the theory that burning pitch is a major factor in plant fire damage. Both were roofed with overlap steel decking and intense heat of over 4 million Btu's per minute was applied to the interior of the buildings containing oil burners.

The Villain—According to J. A. MacAlarney, Ford director of plant engineering, the tests indicate that flames at the two Livonia fires were spread and fed by the vapor seal which consists of two plies of roofing felt mopped to the decking with asphalt pitch.

"While we aren't sure what sort of roofing material we will use on our new factories," Mr. MacAlarney said, "we definitely won't use the vapor seal method. Our hope is that roofing manufacturers will come up with a fire-proof adhesive that won't fall into the building in droplets of flame like asphalt pitch does."

Five Affected — The new Ford plants affected by the order are the assembly plants under construction at San Jose, Calif., Louisville and Mahwah, N. J., and the stamping and Hummel engine plants at Cleveland.

The test was witnessed by more than 150 construction, insurance and fire officials.

"Don't Shut Off the Gas"

Modern continuous heat-treating processes in industry make it necessary that the problem of gas service interruption be solved, delegates to the 35th annual American Gas Association convention in St. Louis were told last week.

Frank H. Adams, president, Surface Combustion Corp., Toledo, O., said industrial demand for gas can no longer be considered a reserve to be interrupted whenever a cold wave develops. Interruption of service, because of the increased use of continuous automatic furnaces and other heat-treating devices, can be far more serious today than in the past.

"Probably 99 persons out of 100 think industrial heating means space heating and do not realize that it is a major energy source creating jobs and consumer income," he pointed out.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

By announcing the government will undertake construction of the first industrial atomic power plant, the old controversy about government in business gets new fuel

R. ADM. Hyman G. Rickover, as construction boss for the world's first industrial atomic power plant, undoubtedly will find himself in the middle of a controversy that is already hot and probably will get hotter as the project develops.

Thomas E. Murray, commissioner of the Atomic Energy Commission, announced the government, with Westinghouse Electric Corp., Pittsburgh, as prime contractor, will undertake the task instead of private industry. This, he said, "is America's . . . significant peacetime answer to recent Soviet atomic weapons tests."

Almost Immediately—Maurice B. Mumford, president of the Uranium Industry Association, Washington, termed the move as another step toward "creeping socialism." In a strongly worded statement, he said, "The Uranium Industry Association . . . will fight to prevent any more such creeping socialism . . . We must recognize that this is a long step toward more government ownership and operation of private business —a landmark step that cannot, must not, go unchallenged."

Almost as quickly, Secretary of Interior Douglas McKay said in a radio interview, "It may be necessary for the government to build the first pilot plants. Ultimately private industry should be allowed to build under licensing from the government."

In the Meantime—Plans are going ahead to put the new 60,000-kilowatt plant into operation within three or four years. It will not be a dual-purpose plant, as proposed by General Electric Co.'s president, Ralph J. Cordiner (STEEL, Oct. 26, p. 77), but will produce only power. GE officials had announced the desire to build an atomic plant to produce plutonium as well. Now it would seem that GE's plans have been nipped in the bud, which may add further fuel to the controversy.

Wide World

R. ADM. HYMAN G. RICKOVER
. . . *caught in the middle*

NLRB To Be More Selective . . .

Under a policy redetermination proposed by Chairman Guy Farmer, the National Labor Relations Board would sharply reduce the number of dispute and violation cases it would consent to handle in the future. Under the contemplated change, the board would undertake to regulate only cases having "substantial" impact on interstate commerce. "I think perhaps the time has come," said Mr. Farmer, "to accept the proposition that it is not necessary or even desirable for the federal government to step into every labor dispute, however insignificant it might be."

The board at present is handling election and unfair labor practice cases at a rate of more than 14,000 in a 12-month period, and it is issuing formal decisions at an average rate of 13 per day. Many of those involve small local business which only by a considerable stretch of the imagination may be regarded as affecting interstate commerce.

Belief is that with newly appointed members in a dominating position on the board, policies will be reviewed generally. "There will be a careful re-examination of existing board precedents," declared Mr. Farmer. "Precedents are a useful tool, but no precedent is good if it is wrong, and we do not propose to treat a decision as a strait jacket."

FCC Ruling Takes Hold . . .

Widespread compliance is reported by the Federal Communications Commission with its ruling that after June 30, 1953, all industrial electric heating equipment must be certified as operating within the limits set by the commission on interference with authorized radio service. That is, it must have sufficient shielding and filtering to keep radiation within 10 microvolts per meter at one mile or more distance away.

The commission still is considering industry comments with a view to setting a date after which arc welding equipment manufacturers would have to build such equipment to insure its operation within the same radiation limits.

New PO Machine Under Tests . . .

Expectations are that the Post Office department soon will be contracting with private manufacturers for a new type of mail sorting machine. The prototype, developed by Israel Rodkin and Jacob Rabinow at the National Bureau of Standards, now is in the test stage at the Post Office's Research Division.

"This is not a so-called brain machine," a spokesman told STEEL. "It still will require human beings to read names and addresses. With the new machine, however, the operator drops envelopes and packages on feeder belts equipped with cams to eject the pieces into the proper bins. The result will be less work for operators and speedier sorting."

This Board Too...

LISTS AMERICA'S FOREMOST MANUFACTURERS

Through the years this board has carried the names of America's best known manufacturers. They build their names on quality products at fair price and they must have sturdy, long-lasting, maintenance-free, high-production, precision equipment to achieve this end consistently.

Getting just such quality equipment is the reason why their names appear on this board. For this is the Production Board at Plant 2 of the McKay Machine Company, one of the world's best known builders of standard and special metal working machinery.

For example, if you were to read the board the day the photographer took this picture you would find such familiar names as Ford Motors, Motch and Merryweather, Fisher Body, General Electric, Kaiser, Youngstown Sheet and Tube, Aluminum Company of America, Wean Engineering, Wheeling Steel, Standard Tube, and LaSalle Steel. At any other time, just as impressive a list of leading manufacturers could be found on this board.

So, if you use special or standard metal working equipment such as forming machines, draw benches, tube mills, levelers, upcoilers, strip processors, press feed lines, shear lines, coil handling equipment, join America's best known manufacturers on this McKay Production Board.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

SEVEN DIFFERENT PRODUCTION OPERATIONS ON ONE STANDARD WELDER

Versatile Sciaky Standard Three-Phase Projection Welder Sharply Reduces Tooling Costs

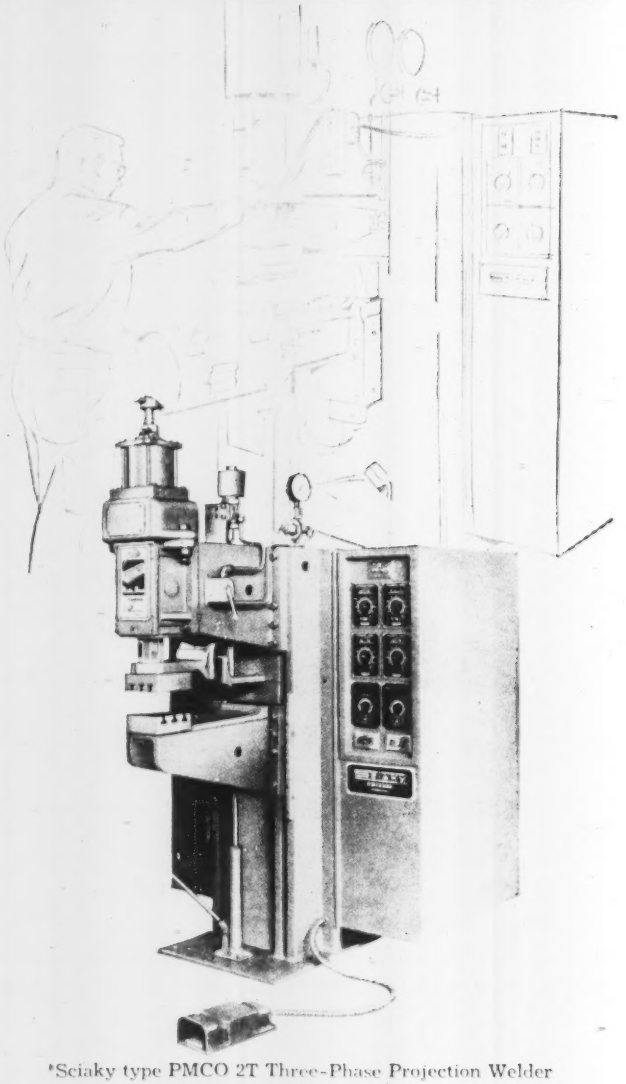
With typical efficiency, Moloney Electric Company uses a minimum number of Sciaky machines for a maximum number of welding operations.

After careful study, Moloney found Sciaky electric resistance welding offered many advantages over other methods of fabrication. Sciaky patented Three-Phase principle of operation provided automatic compensation for variation in material thickness, piece-part configuration, and fit-up to improve weld quality and machine versatility.

Only Sciaky Three-Phase characteristics of balanced line load, high power factor, and 75% current reduction permitted such extensive use of resistance welding with existing power supply.

Now Moloney pressure-tight transformer tanks, from 10" to 30" in diameter, and 21" to 54" in height, are fabricated almost completely on Sciaky Three-Phase welders.

For complete details on the efficiency and economy of Sciaky resistance welding at Moloney, write for "Resistance Welding at Work", Volume 3, No. 7.



Sciaky type PMCO 2T Three-Phase Projection Welder joins seven different parts to Moloney Transformer Tanks. A two-switch foot pedal provides immediate selection of preset heat and pressure sequences for different welds without removing tank from welder or stopping production to reset controls.

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Britain Rebounds

Record September steel output heightens possibility of a 19-million-ton year

BRITISH steel output snapped out of its summer lull even further than STEEL predicted on Oct. 5 (p. 57).

September output was at an annual rate of 19,821,000 net tons, or a weekly average of 381,150 net tons. (STEEL predicted a jump to a weekly operating rate of 370,000 net tons in September from 320,000 net tons in August.)

Records Tumble — The 20-million-ton operating rate is nearly a million tons over the rate at this time last year and sets a new high in steel output for September. Pig iron production for the month was also a record, averaging 235,290 net tons a week.

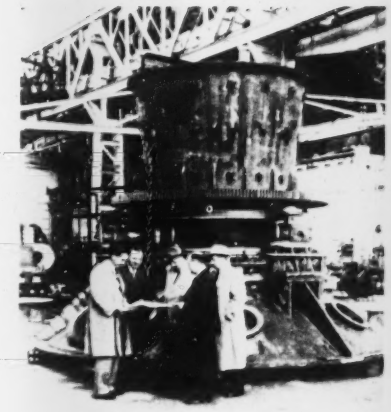
Behind the rising steelmaking rate is a spurt in new orders from British metalworking industries. The automotive industry has forged to the head of the revival and is banking heavily on small-type cars which were gaining in popularity just before World War II. Railroad car builders are booked solid for many months ahead. Production is limited only by the availability of plates.

Even These — The construction industry has its hands full, especially with expansion of electrical power plants. Even the demand for light castings has taken a slight upward trend, following increased activity among the automobile manufacturers. Full production among foundries supplying the automotive trade is assured through the end of the year.

Britain's steel output continues to be in stark contrast to other European producers. During the first eight months of 1953 steel output of the European Coal & Steel Community countries dropped by 550,000 net tons compared with same period of 1952.

British Productivity Booster

The British Steel Castings Research Association announces the development of a rotary metal sampling device which enables furnace samples of steel or other metals to be produced in finely granulated or divided form directly from the liquid state, eliminating the necessity for drilling operations. The device has been tested in analyses for not only the normal elements carbon, sulphur, silicon, phosphorus and manganese but also for nickel, chromium, molybdenum and tungsten.



Big One in Quick Time

H. A. Brassert & Co., New York, is completing construction of one of the largest blast furnaces in Europe at the Westfalenhuette A. G., Dortmund, Germany, in the record time of 11 months. D. R. Knall, Brassert & Co., Dr. Lauffer, director of Dinglerwerke-Zweibrucken, and engineer Heppner of Westfalenhuette (left to right) inspect the revolving distributor made by Dinglerwerke in Switzerland

Steel from North Korea

North Korea has produced its first steel since the end of hostilities there, says the official Russian newspaper *Pravda*.

Output of the first electrosmelting furnace restored to operation was said to be 25 tons daily. A second North Korean electrosmelting furnace is scheduled to go into production this month.

Stainless Export Permits Open

Applications are being taken for licenses to export nickel-bearing stainless steel against first-quarter 1954 allocations, the Bureau of Foreign Commerce announces. The filing period which ends Nov. 6 applies to all shapes and forms, semifinished and finished steel.

Savings in Export

Ditto Inc. changed export containers and realized savings in packing and transport

DITTO INC., Chicago, has saved more than 70 per cent of packing and transportation costs on its export shipments through a switch from wooden cases to steel strapped fiberboard cartons.

Ditto's first experiment was shipping printing papers in fiberboard boxes lined with waterproof paper and reinforced with Acme Steel strapping. Packing expenses were cut up to 75 per cent and transportation costs up to 80 per cent.

Thousands of Dollars—Next, gelatin duplicating rolls were shipped overseas in five-ply laminated fiberboard boxes reinforced with steel strapping with a resultant saving of "thousands of dollars annually," says Ditto. Now practically all Ditto products main exception being their duplicating machines are shipped in steel strapped fiberboard containers. And the company is testing a lighter duplicator package.

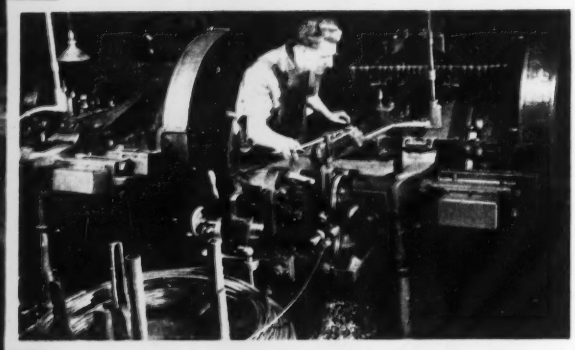
After four years' experience with this method of export packing, Ditto reports not one serious damage claim due to lighter packing.

U.S. Invests in Canada

Private U. S. investment in Canadian industry rose to nearly $5-billion in direct investments by mid-1953. That has been accomplished through an annual rate of growth of over $500 million since 1950, says the Office of Business Economics following release of a survey entitled "Foreign Investments of the U. S."

Two-thirds of the U. S.-controlled enterprises are Canadian corporations, accounting for nearly 90 per cent of the U. S. investment. Manufacturing plants account for the largest share of U. S. investment capital in Canada, over 50 per cent of the 1950 total of $3.6 billion.

Leading categories of manufacturing investments in 1950 were paper and allied products with $368 million, primary and fabricated metals with $249 million, food products with $227 million and nonelectrical machinery with $204 million.



Townsend Co. engineers and representatives from prospective customer firms (left) gather in seminars to discuss what can and cannot be done by cold heading. News for the potential customers: Cold-heading machines (above) can produce a wide range of products

Selling by Seminar

Townsend Co., maker of cold-headed products, asks its competitors to help put an informative twist into salesmanship

SELL THE PROCESS first, then the company performing that process.

That's what Townsend Co., New Brighton, Pa., is trying and successfully with cold heading. It would like to get its competitors interested in a joint effort to open up market for cold-formed products, which Townsend President F. R. Dickenson believes has a $200-million annual sales potential.

Definition — Cold heading — also called cold forging or cold upsetting — consists of taking a reel of steel wire, cutting it to length and "upsetting" one end by a sharp blow or two. Dies force the steel to flow into the desired shape at the head end. New tungsten carbide dies have broadened possibilities for using cold-formed products by keeping tolerances steady throughout a long production run. (Watch for STEEL technical article on cold heading coming soon.)

Most cold-headed parts are standard rivets, bolts and screws, but in recent years more and more special headed parts have been made. Townsend alone produces 10,000 separate items ranging from rivets and other fasteners to shrapnel for mortar shells and axles for electric trains.

Action? — How has Townsend progressed with its own evangelistic program for cold heading? Mr. Dickenson devised a plan of periodic seminars in which prospective customers are invited to New Brighton as Townsend's guests for an all-day meeting. First session covered two days—Feb. 10-11, 1953. General Electric Co. sent 19 men from 13 plants to that meeting.

At a typical seminar, Sept. 16, 1953, 15 executives from Westinghouse Electric Corp., Pittsburgh, were invited to New Brighton. Engineering and production men showed them through the plant, demonstrating operations of cold-forming machines. Later talks were presented on "Highlights of Cold Heading" and "Engineering for Cold Heading." Robert J. Ritchey, assistant general sales manager, acted as host.

Double Benefit — Five seminars have been held thus far. Mr. Ritchey points to two solid achievements of the programs: "We get the prospective customer out to our plant, where we can show him our product and our operations. We influence top-level scientific thinking on advantages of cold forming over other methods. Executives at the policy-making level start to ask, 'How can we change to use of cold formed products?'"

"We want to get across the idea of cold forming," Mr. Dickenson says. "A switch to cold-formed products may require the customer to change his product design slightly, so we invite engineers and show them how this is done. Use of

cold-formed products may call for a policy change on the customer's part, so we have our ideas carried back to top management."

Competition, Competitors — Knowing its own product thoroughly, Townsend is answering the challenge of the buyers' market with carefully directed salesmanship. "We're planning traveling exhibits as well as more seminars," announces Mr. Ritchey. "We're just getting started."

That's another reason Townsend would like to join hands with its competitors in the educational process now.

Small Firms: Big Business

Small business, which during the last fiscal year received over half of the Army's expenditures for goods and services, can look forward to an even greater share, Robert T. Stevens, army secretary, predicts.

From July 1, 1952, to June 30, 1953, small business—those firms employing 500 persons or less—won contracts amounting to over $3.9 billion of the total $7 billion spent by the Army.

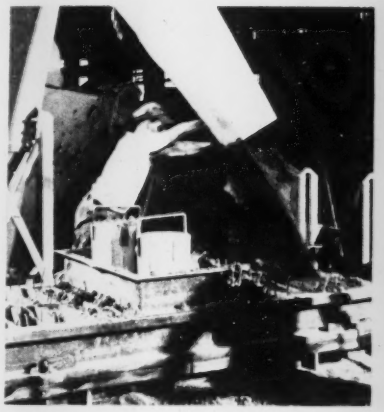
Sylvania Cites Research

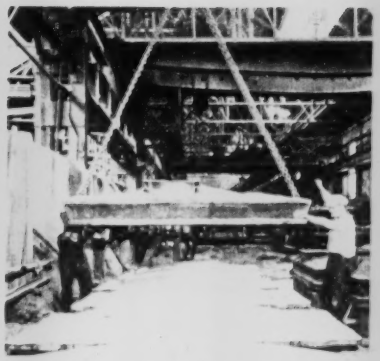
Sylvania Electric Products Inc.'s powder metallurgy research in the near future will concentrate on recrystallization and grain growth during sintering and basic studies in the preparation of alloys by powder metallurgy. That's what 30 scientists from Belgium, Denmark, France, Germany, Italy, Netherlands and United Kingdom heard on a visit to Sylvania's metallurgical laboratories at Bayside, N. Y.

The scientists are on a five-week tour of American powder metallurgy labs and plants under the auspices of the Foreign Operations Administration.

Light Product-Heavy Impact

Aluminum foil's impact on the container and packaging industry is reflected in the second quarter volume reports of the industry by the Commerce department. Foil shipments were up 55.2 per cent over the volume for the first six months of 1952.





Bethlehem's iron foundry is now casting 50 of the 3400-pound segments for the Lincoln Tunnel daily and expects to increase production to 80 per day in February. The segments are approximately 7 feet long and 32 inches wide

Bethlehem Casts a Tunnel

HOLDING BACK the Hudson river is an old story to foundrymen at Bethlehem Steel Co.'s Bethlehem, Pa., plant. They are about to do it again with 28,000 iron and 1800 steel rings.

The rings, which will form the outer shell of the new $90-million third tube of New York city's Lincoln Tunnel, will each be made up of 14 segments, now being cast and machined by Bethlehem.

In the mud of the river botton the tunnel walls will be formed of iron segments, but steel will be used to absorb bending stresses at points where the tunnel enters rock. Where the tunnel changes direction, hard-to-manufacture tapered segments are required. About 10 per cent are tapered.

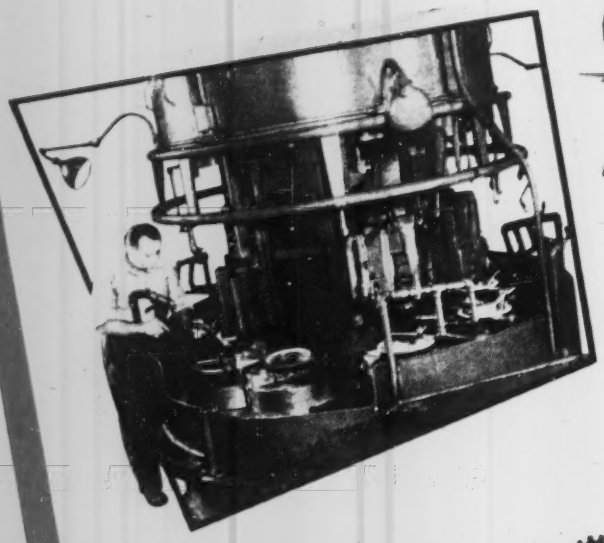
Bethlehem, which has been producing tunnel segments since the turn of the century, is machining the Lincoln Tunnel segments on machinery specially designed for the work and used for no other. Among the New York tunnels the company has made segments for in the past are the Holland, Lincoln, Queens, Midtown and Brooklyn-Battery.

Tunnel segments must be milled to close tolerances to make a tight fit when they are bolted together to form the outer tunnel casing. After machining, the segments pile up at the Bethlehem plant awaiting shipment to New York

. . . a customer speaks with

CONFIDENCE

in his manufacturing equipment



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THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Maybe you aren't enthusiastic about facelifted cars, but it helps keep a "new look" on them. To change models radically every year is prohibitively expensive

DETROIT

PROBABLY you feel much the same about facelifted automobiles as you do about your wife's new hair styles—try as you will to work up enthusiasm, somehow underneath it's the same old model.

Although the automakers want to keep their products as interesting as possible, it's about as feasible to change cars radically as it is to change wives every year. The wealthy might be able to afford both for a short time, but the cost penalties would soon get them down.

Big Difference—Hence the need for the facelift, but the difference between you and an automaker is that his "beauty parlor" bill runs upwards of $10 million annually. A new pair of facelift bumpers costs $500,000 in dies, a new grille rings up about $300,000, the exterior trim pieces each take from $40,000 to $250,000 since dies for stainless must be particularly smooth to avoid scratches and even an unpretentious strip costs about $30,000 for the forming rolls and $12,000 or so for the end-closing dies.

But that's only the manicure. A typical facelift involves not only grille trim and bumper changes, but also changes in tail lights and head lights, interiors, instrument panels, stone shields, hardware and colors. And then, when these items have been attended to, there is still the matter of mechanical improvements which in themselves constitute a considerable bulk of the facelifting cost.

Costly—Automation is a big reason for the costliness of mechanical innovations. For while it's outstandingly good at its job, automation is exceedingly set in its ways. The introduction of a relatively simple machining change which lengthens the time a part must spend at a station goofs up the work flow gloriously. The only solution is to slow down the line or add an extra unit in the line to spread the cut over two passes. The second alternative is in greatest favor, but it involves yanking out huge sections of automated line and often replanting and rewiring a considerable quantity of equipment.

Calculated—These costs have all been anticipated. The automaker is notably thorough in his pursuit of the greenback, and during the year as the engineers dream up ideas the cost estimators translate the more likely ones into production down to the last drill bit. The sales department recommends which of the possible features the new model ought to contain.

The final decision on which of the features will go into the facelift is in the hands of management. If the car has been relatively successful and demand is strong there is little required of the facelift. But management walks a neat little tightrope if the car has proved itself a sales lemon in the months previous. Drastic measures are called for to perk up sales, but the car may already be in the red and pouring a great deal more money into a gone goose could produce further losses rather than a golden egg.

Improved Upon — Frequently, however, the facelift cars are equally or more successful than their prototypes. A car which had good lines and good performance when it was first introduced will usually come up with better performance, better lines and probably better interiors the second time around. That's why it sometimes pays to wait a year before buying that new chariot. The rerun may offer considerably more value for your purchase dollar.

The virtues of the facelift as a sales booster grow more significant as competition stiffens in the auto industry. A tendency toward more far-reaching annual facelifts and more frequent new body introductions is already in the offing. Automakers in the past have offered deluxe versions of their cars in the late spring as sales boosters and the practice seems likely to recur.

Something To Watch—Plastic tooling if developed to a production level could do much to change the picture by lowering costs, possibly even making new bodies an annual proposition. But until the automakers get plastic into their facelifting surgery it will remain expensive. In the days ahead, independents who cannot afford the extensive retooling of their competitors may find themselves facelifted right out of business. The seemingly innocuous facelift is just that important.

Chrysler for 1954

A handy example of facelifting magnitude is Chrysler for 1954. With horsepower increases up to 235 on New Yorker Deluxe and Imperials, PowerFlite transmission on all V-8 models, new interiors and new exterior trim, the new Chryslers show some hefty effort that belies the term "facelift."

Better engine breathing accomplished through dual exhausts and

CHRYSLER FOR 1954
. . . a far-reaching facelift

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headers coupled with larger manifolds and valves, four-barrel carburetor and bigger air cleaner are basically responsible for the horsepower increase. Watch for the safety spinsters to start screaming about too much horsepower again.

Incidentally, Chrysler replaces the ammeter and oil pressure gages with lights in its redesigned instrument panel. The driver who could read numbers knew much of battery, voltage regulator and engine condition through those two instruments. Now you'll just rely on a warning light to give you time to bail out in case the car is ready to burn up.

On the Willow Run

An aircraft plant approximates closely an indoor junk yard. Conceivably it could have taken a couple of months to clean out GM's portion of Willow Run without installing anything, yet a visit to the plant last week reveals some departments already in operation and pilot production near.

Biggest hurdle to operation was getting the plant ready to receive the equipment. There aren't many things more complicated to build than Hydra-Matics involving as it does grinding, machining and final assembly that must be absolutely dirt free. Consequently with the prohibitively high ceiling a grid had to be constructed about 20 feet off the floor over the entire plant to carry electricity, air, oil and ventilating supply lines. In addition, a room 240 x 600 ft was built to house final assembly in which an air pressure 0.5 psi over normal and constant temperature of 74 degrees F could be maintained.

A pit for quenching tanks large enough to receive a ranch-type bungalow was dug right in the middle of the plant and eleven 15,000-gallon oil storage tanks were sunk just outside the plant. This installation project involves over 2400 contractor-employees as well as 1700 hourly and 1500 salaried GM personnel.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,343	595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Sept. 26	140,953	141,228
Oct. 3	142,824	143,234
Oct. 10	148,779	138,035
Oct. 17	152,743	138,088
Oct. 24	150,002	144,747
Oct. 31	150,000*	155,037

Source: Ward's Automotive Reports.
*Estimated by STEEL.

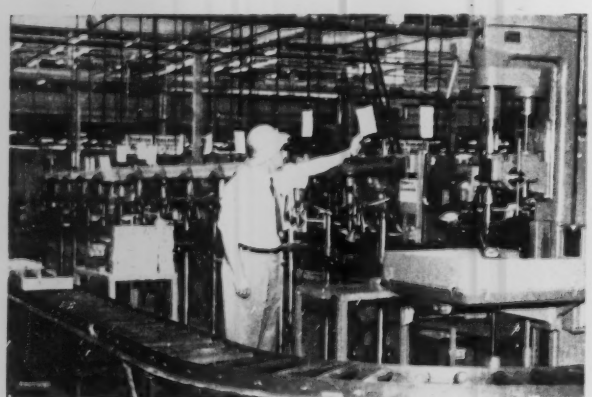
Late last week virtually all of the equipment needed for production had been received at the plant. Tickets in three parts are attached to each machine. The first portion is torn off when the machine is received, the second when it is installed and the third when it is OK for production. The former department heads from Livonia are supervising the installation of their equipment just as they supervised its removal after the fire. The exact status of each piece of equipment is kept on a master chart of the plant and the chart is filling up rapidly.

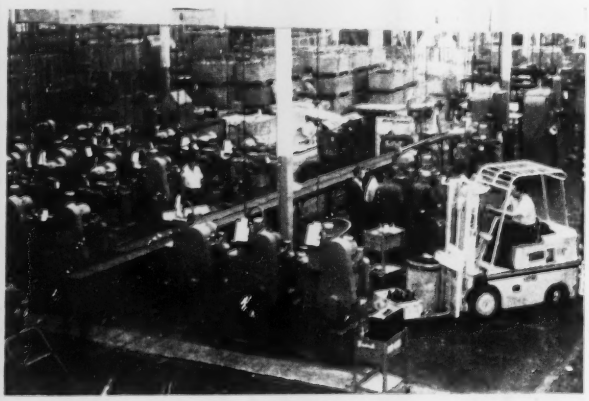
Some substitutions had to be made. Fourteen baby drill presses are replacing one Kingsbury machine which could not be returned in time. But most of the equipment looks like new, though only about 12 per cent of it is, according to one estimate. The equipment is going in fast. Pilot production should be coming off the line sometime this week, production in earnest later this month.

The Detroit transmission episode is an outstanding tribute to the nation's largest football sponsor.

Exhaust Notes

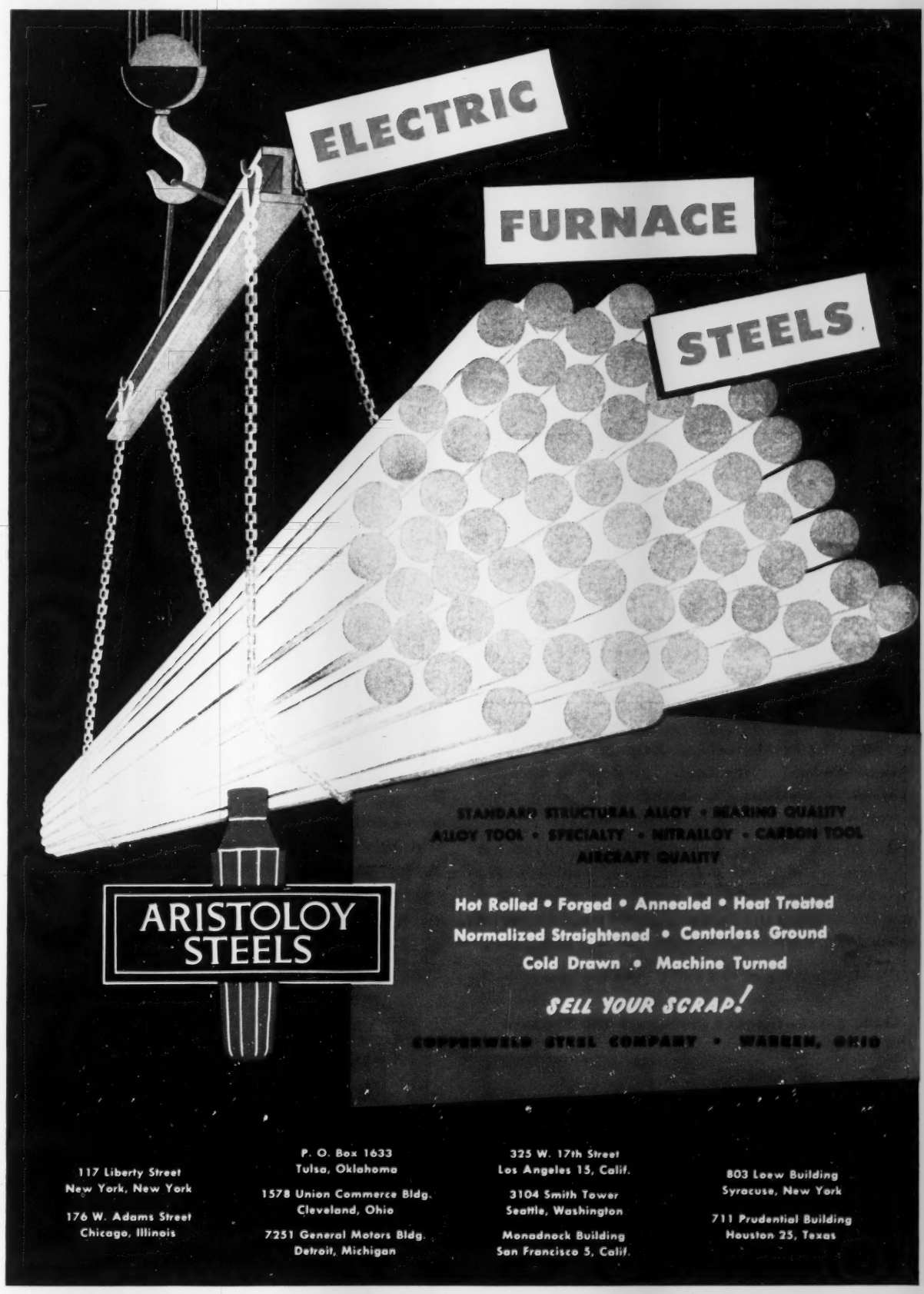
Livonia will be rebuilt and tooled to produce a new transmission under development for some years and slated prior to the fire to replace Hydra-Matic . . . Chrysler's purchase of Briggs Mfg. for $35-million is a move to keep competitive with Ford and GM expansion.





Transition to Transmissions

Not the least of the problems involved in converting Willow Run to the Detroit Transmission Division of General Motors Corp. are the 3300 machines which must be moved in while inventories of parts pile up. Simple machines such as these drill presses (left) will have to perform many production jobs until special purpose tools arrive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These are the parts:

1. Diesel injection pumps
2. Lathe centers
3. Slitting rolls and knives
4. Cam rollers for automotive steering gears
5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Ball bearings
11. Asbestos disintegrators
12. Mill rolls

This is the steel:

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An alloy steel of high-carbon analysis, 52100 has high tensile and fatigue strength. It's fully spheroidized structure makes machining easier. And 52100 withstands a working pressure of 200,000 p.s.i., can be oil quenched to a maximum hardness of 65/66 Rockwell C.

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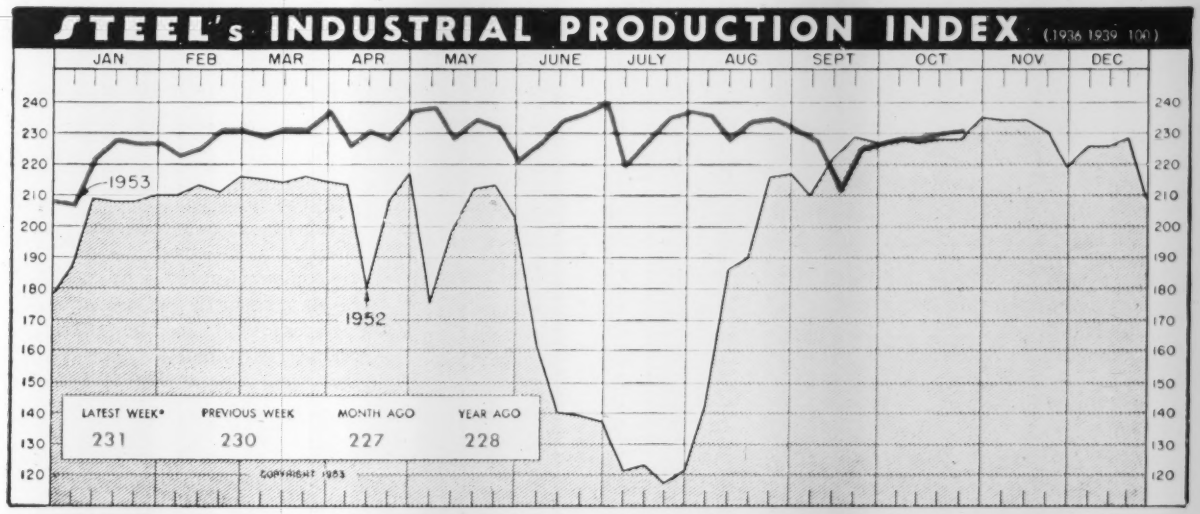
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend



*Week ended Oct. 24 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Anticipated tax relief is a major factor in favorable predictions of next year's production. Sales costs to rise. Present period is one of high-level caution

INDUSTRIAL production is at a high level as November starts, but the new month is apt to bring a seasonal decline.

With war pressures off, the economy is free to reflect seasonal influences. Normally, November doesn't quite keep up the pace that prevailed in October.

A seasonal rise is expected after the first of the year, and many businessmen believe this will put 1954 production levels not far behind those of 1953. This belief appears to be based in large part on income tax relief to the consumer. If that relief fails to generate a hefty sales volume, primary reliance will be placed on price reductions.

As October neared an end, STEEL's industrial production index registered a preliminary 231 per cent of the 1936-1939 average in the week ended Oct. 24, a 1-point rise over the preceding week.

Sales Outlays Rise . . .

To tap the potential opportunities offered by high disposable personal income and to overcome buyer resistance, many manufacturers are planning to increase their sales expenditures. Over-all sales expenses, as a percentage of sales, are as high or higher today than they were last year for 75 per cent of the 155 manufacturing companies surveyed by the National Industrial Conference Board. Furthermore, half of these same companies expect to increase their expenditures in 1954, partly due to intensified sales efforts.

Trying To Stay Competitive . . .

These companies are also preparing to overcome price competition, generally through lower production costs. A successful reduction in distribution costs appears to be difficult, and the maintenance or improvement of quality against a background of rising costs is a tough problem.

Caution Predominates . . .

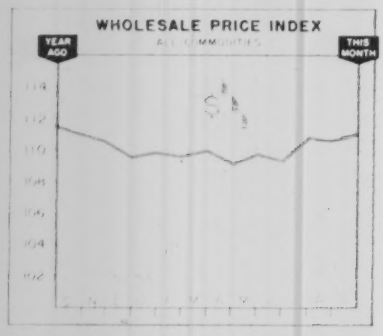
But for the difficult-to-measure effect of tax relief, current conditions would not augur well for the future, except that these conditions reflect to some extent future planning. The reduced pace of industrial activity is holding down the volume of bank clearings to only slight gains in the last several weeks, as compared with the corresponding weeks in 1952. And in the latest week, the week ended Oct. 21, check clearings in 25 leading cities dropped 5.4 per cent below the similar 1952 week, Dun & Bradstreet says. Viewed optimistically, the reduced volume of transactions reveals a cautious attitude concerning the future and some postponements of activity.

Business Loans Slow Down . . .

Partially responsible for the downturn in check clearings is the failure of business loans to expand as much seasonally as a year ago. In the week ended Oct. 21, total commercial, industrial and agricultural loans of the 21 banks which report weekly to the Federal Reserve System amounted to $8512-million, only $274 million above a year ago. The decline can be seen clearly by comparing the business loans made since midyear by New York city banks with the same period in 1952. The gain for the recent months totals $258 million as against $677 million in the corresponding 1952 period.

Desire for Liquidity . . .

Future planning and the desire for liquidity is also apparent in the great increase that took place in

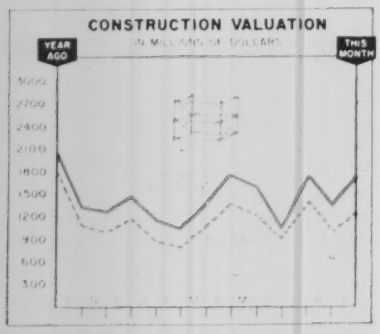


Wholesale Price Index

(1947-1949 = 100)

	1953	1952	1951
Jan	109.9	113.0	115.0
Feb	109.6	112.6	116.5
Mar	110.0	112.3	116.5
Apr	109.4	111.8	116.3
May	109.8	111.6	115.9
June	109.5	111.3	115.1
July	110.9	111.8	114.2
Aug	110.6	112.2	113.7
Sept	111.0	111.7	113.4
Oct		111.1	113.7
Nov		110.7	113.6
Dec		109.6	113.5

U. S. Bureau of Labor Statistics

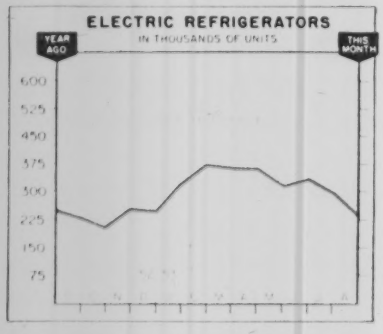


Construction Valuation

(37 States—In Millions of Dollars)

	Total		Building	
	1953	1952	1953	1952
Jan	1,075.9	992.1	867.0	695.4
Feb	1,021.3	885.2	792.9	697.8
Mar	1,347.5	1,321.3	1,054.4	1,056.0
Apr	1,741.5	1,597.5	1,354.2	1,243.9
May	1,606.1	1,563.6	1,219.8	1,216.2
June	1,115.5	1,488.8	922.3	1,133.3
July	1,793.3	1,511.3	1,417.8	1,170.8
Aug	1,414.4	1,438.7	1,053.4	1,147.5
Sept	1,741.7	2,039.2	1,290.7	1,790.8
Oct		1,310.1		1,072.8
Nov		1,248.8		989.9
Dec		1,467.4		1,147.7
Total		16,774.9		13,362.1

F. W. Dodge Corp.

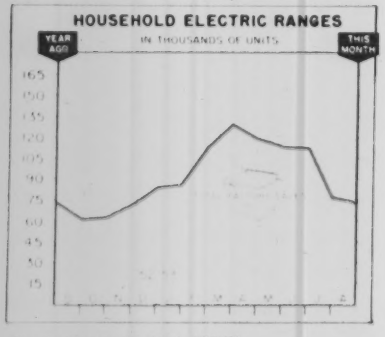


Electric Refrigerators

Total Factory Sales—Units

	1953	1952	1951
Jan	325,186	260,259	465,903
Feb	377,605	259,838	403,035
Mar	368,498	276,972	558,503
Apr	366,561	225,994	409,887
May	317,667	217,017	309,722
June	343,114	324,886	261,298
July	298,838	333,877	163,922
Aug	232,981	250,224	165,309
Sept		230,111	193,929
Oct		267,065	191,519
Nov		256,530	147,394
Dec		248,506	195,403
Total		3,091,431	3,465,824

National Electrical Mfrs. Assn.



Household Electric Ranges

Total Factory Sales—Units

	1953	1952	1951
Jan	88,145	79,982	130,316
Feb	114,465	63,063	121,585
Mar	130,788	93,225	159,865
Apr	118,999	69,149	118,823
May	114,404	68,117	106,685
June	113,986	86,847	106,589
July	77,836	83,465	60,530
Aug	74,326	74,853	64,042
Sept		62,404	93,551
Oct		63,143	109,043
Nov		72,982	101,476
Dec		84,630	72,140
Total		901,860	1,244,645

National Electrical Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Oct. 12	Gray Iron Castings	Oct. 19	Ranges, Gas	Oct. 12
Employ., Metalwk	Sept. 28	Indus. Production	Oct. 26	Steel Castings	Oct. 19
Employ., Steel	Oct. 26	Ironers	Sept. 21	Steel Forgings	Oct. 19
Fab. Struc. Steel	Sept. 21	Machine Tools	Oct. 5	Steel Shipments	Oct. 12
Foundry Equip.	Sept. 14	Malleable Castings	Oct. 19	Vacuum Cleaners	Oct. 12
Freight Cars	Oct. 26	Prices, Consumer	Sept. 28	Wages, Metalwk.	Sept. 28
Furnaces, Indus.	Sept. 14	Pumps	Aug. 24	Washers	Sept. 21
Gears	Sept. 21	Radio, TV	Oct. 26	Water Heaters	Sept. 14

adjusted demand deposits during the week ended Oct. 14. Checking account balances were increased by $346 million. This compares with a decrease during the period from Oct. 15, 1952, of $61 million. In other words, the gain in the latest week has reduced the over-the-year decline to only $61 million.

New Orders Drop Sharply . . .

In the industrial sphere, manufacturers' net new orders on a seasonally adjusted basis declined substantially in July and August from the high level of the second quarter, according to the Office of Business Economics. As the cutback was due largely to canceled orders for military hard goods, the drop in new orders was confined to the durable goods industries. Net new orders for machinery were affected sharply by the decline. As a result the backlog of orders for machinery dropped to $8.6 billion, the lowest amount of unfilled orders since early 1951.

Inventories Slacken . . .

Business inventories in August continued their rise but at a reduced pace. The book value of inventories held by manufacturing and trade firms, seasonally adjusted, increased by $450 million in August, as compared with $650-million in July and a $700 million average monthly rate in the second quarter. Actual physical stock additions in August were down more from the second quarter than the book values indicated due to higher replacement costs. The high value of total inventories, about $88 billion, should come in for book value reductions if prices fall. Concerns using LIFO would have fictitious dollar values at such a time, yet, as pointed out by the National Association of Purchasing Agents, no relief is available since Section 22 of the Internal Revenue Code of 1939 does not provide for the revaluation of a high-cost inventory down to market levels.

Cash Dividends Up . . .

The hefty sales of the year to date have put corporations in a better position to face the future. Evidence of their well-being is

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	95.5	95.0	105.5
Electric Power Distributed (million kwhr)	8,306	8,265	7,696
Bitum. Coal Output (daily av.—1000 tons)	1,586	1,546	1,397
Petroleum Production (daily av.—1000 bbl)	6,310[1]	6,311	6,538
Construction Volume (ENR—millions)	$289.3	$268.9	$260.3
Automobile, Truck Output (Ward's—units)	150,002	152,743	144,747
TRADE			
Freight Car Loadings (unit—1000 cars)	815[1]	823	761
Business Failures (Dun & Bradstreet, no.)	185	169	154
Currency in Circulation (millions)[3]	$30,305	$30,412	$29,511
Dept. Store Sales (changes from year ago)[3]	−5%	5%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,380	$15,899	$20,486
Federal Gross Debt (billions)	$273.1	$273.0	$264.8
Bond Volume, NYSE (millions)	$14.4	$11.9	$14.9
Stocks Sales, NYSE (thousands of shares)	6,452	5,743	5,521
Loans and Investments (billions)[4]	$78.9	$79.1	$77.6
U. S. Gov't. Obligations Held (billions)[4]	$31.3	$31.4	$32.8
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	203.2	202.4	212.6
All Commodities[7]	110.0	110.1	111.1
Commodities Other Than Farm & Foods[7]	114.6	114.6	113.0

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [4]Federal Reserve Board. [5]Member banks, Federal Reserve System. [6]1935-1939=100. [7]1936-1939=100. [8]Bureau of Labor Statistics Index, 1947-1949=100.

found in the amount of cash dividends paid. Corporations issuing public reports paid cash dividends of $1235 million in September, 6 per cent above the $1166 million paid out in the same month a year ago, the Office of Business Economics says. Nonmanufacturing industries expanded their dividend payments 9 per cent over September, 1952, while payments of manufacturing corporations were 4 per cent above the same month—largely a reflection of a shift in payment dates from August to September. On the basis of the first nine months of the year, when dividend payments were up 4.5 per cent from the same months in 1952, higher dividend rates and share capital expansion were responsible for increases in payments by the oil refining, iron and steel and machinery industries. The 16 per cent increase reported by the transportation equipment industry reflected both higher rates and the payment of extras.

Employment Sets Record . . .

The record nonfarm employment levels of September do not leave much to be desired or that is feasible even though this was the second consecutive month that the rise in employment was less than usual. The number of employees on nonfarm payrolls in September, 49.6 million, was an all-time high for the month, and the number of unemployed, 1.25 million, was a postwar low for the month, according to the Bureau of Labor Statistics. Primarily responsible for the less-than-seasonal gain in nonfarm employment was the decline in the number of workers on manufacturing payrolls. From August to September the number of these workers decreased by about 60,000. In recent years an increase of about 200,000 has been normal. The primary metals, machinery and transportation industries all showed declines instead of the usual gains.

Income Still Rising . . .

The July and August seasonally adjusted annual personal income rate of $287 billion, which was about 1 per cent above the second-quarter average, will buttress future buying even though more recent earnings of factory production workers show a less-than-usual seasonal increase. From August to September, average hourly earnings of these employees rose only one cent, to $1.78 per hour.

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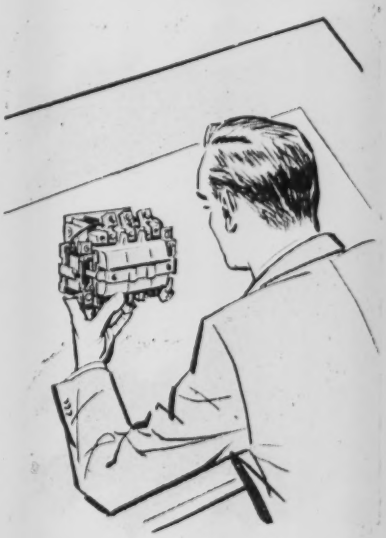

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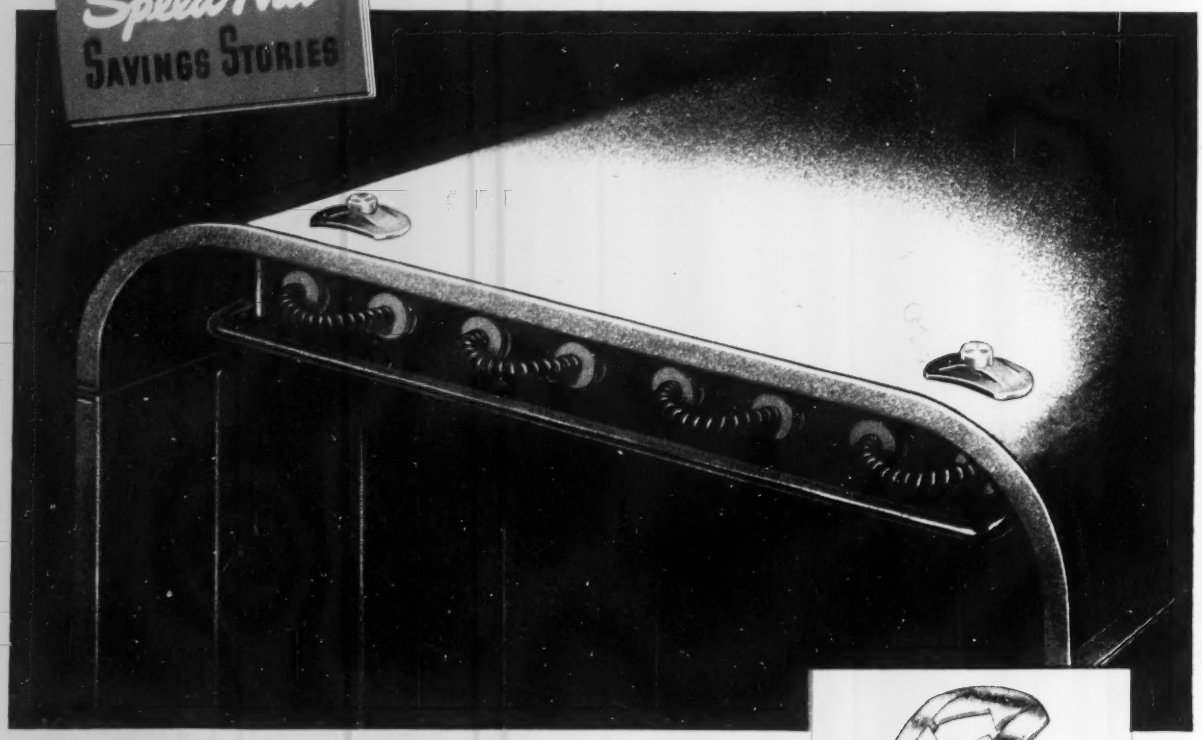

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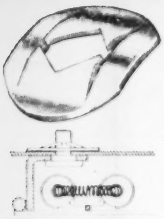

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A. G. TRIVISON
. . . div. mgr. at W. W. Sly Mfg.

ROBERT E. KLARE
. . . Federal-Mogul manufacturing mgr.

J. Edgar Glass was elected president and general manager, **Colson Corp.**, Elyria, O. He succeeds **Neely Powers**, who remains a director of the company serving in an advisory capacity. Mr. Glass was formerly general manager and executive vice president.

G. Clymer Brooke was elected executive vice president, **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa. He had been vice president of the company.

James A. Hughes, a vice president of **Affiliated Gas Equipment Inc.**, Cleveland, and general manager of its Bryant Heater Division since 1951, was appointed assistant general manager of AGE in addition to his duties with Bryant. **Howard L. Clary** was made assistant general manager, Bryant Heater Division.

William O. Robertson, manager of the eastern division of **Armco Drainage & Metal Products Inc.**, Middletown, O., was elected a vice president. He continues in his former post.

Arthur W. Spencer was promoted to district manager of sales for the Farquhar Division of **Oliver Corp.**, Rochester, N. Y. He will direct activities throughout New York state with the exception of New York city.

W. W. Sly Mfg. Co., Cleveland, appointed **A. G. Trivison** manager of its industrial oven division. Associated with the design and sale of industrial ovens since 1937, he was formerly assistant manager of sales for Industrial Ovens Inc.

J. H. Allen, who was in charge of the now discontinued steel division of Minford & Co. Inc., has become vice president of **Dornheim Steel Co.**, New York.

Peterson Steels Inc., Union, N. J., elected **R. G. Willaman** executive vice president, **D. B. Hassinger** vice president, **F. W. Bussell** secretary-treasurer, **R. F. Fischer** assistant treasurer and **H. J. Lawson** assistant secretary.

Russell A. Smith was appointed director of purchases, **Baron Steel Co.**, Toledo, O. For the last ten years he has been executive buyer of raw materials for Packard Motor Car Co.

D. A. Milligan leaves his post as sales manager of Harry Ferguson Inc. to join **American Tractor Corp.**, Churubusco, Ind., as vice president in charge of sales.

W. J. Sonnenburg succeeds **E. F. Vidro**, retired, as Detroit district manager, **Electric Controller & Mfg. Co.** Mr. Sonnenburg was in the Detroit sales office previously.

Robert E. Klare was promoted to general manager of all **Federal-Mogul Corp.'s** manufacturing operations, responsible for plants at Detroit, Cleveland, Mooresville, Ind., and Greenville and St. Johns, Mich. He has been manager of the Greenville and St. Johns plants and is replaced at the former by **Carl F. Brown** and at the latter by **William C. Robertson**. Mr. Klare will have headquarters in Detroit.

Promoted to plant engineer at the Allenport, Pa., works of **Pittsburgh Steel Co.**, **William E. Brown's** new duties include general supervision of engineering work at Allenport and special assignments. **John W. Govier** was made chief draftsman for the works.

Peter S. Blake, former factory manager at Milwaukee for the truck frame division, **A. O. Smith Corp.**, was appointed works manager of the firm's new automotive frame plant now under construction at Granite City, Ill. The plant, which will make fully assembled passenger car frames for Chevrolet, is expected to be ready for initial production by early summer of 1954.

Gordon W. Johnson joined the research and development staff of **Alloy Engineering & Casting Co.**, Champaign, Ill., as associate

DAVID I. DILWORTH JR.

LORIN L. FERRALL

. . . appointments at Crucible Steel Co. of America

project director on casting design-process manual. He was formerly supervisor of foundry research at Armour Research Foundation.

Crucible Steel Co. of America, Pittsburgh, appointed **David I. Dilworth Jr.** director of metallurgy to succeed **Lorin L. Ferrall,** who becomes assistant vice president assigned to the operating department of the company.

Industrial sales engineers appointed by **Parker Appliance Co.,** Cleveland, are **Jack H. Landefeld** assigned the Cleveland-Akron area, **J. H. Atkinson** the Texas Gulf Coast area, **W. Gordon Jarvis** the Rockford, Ill., area and **Michael J. McCaughey** assigned to the Chicago office. **John J. Fegan Jr.** fills a newly created sales engineer position in western New York state, and **Albert V. Zukas** is sales engineer in Parker's aircraft division, Cleveland.

B. T. Rabuse assumes the newly created post of director of purchases of **Gould-National Batteries Inc.,** Trenton, N. J. **Willard C. Shull** was named purchasing agent.

Rhoderick W. Key, formerly a salesman, has been promoted to purchasing agent and office manager of **Caine Steel Co.'s** St. Louis warehouse.

Misco Precision Casting Co., Whitehall, Mich., appointed **Francis J. Coates** sales manager and **William J. Flessner** in charge of its industrial engineering department. **W. I. Dieters** joined the firm as staff engineer and **D. O. Ryan** as personnel director.

At **Morrison Steel Products Inc.,** Buffalo, **Kenneth L. Nichols** was made chief design engineer, **Coleman S. Lopcsak** supervisor of industrial engineering and standards, **Richard Ziemann** production engineer and **Robert E. Hanna** supervisor of experimental and layout department.

N. H. Polakowski, formerly of University College of Swansea, England, is now identified with **Sendzimir Ltd.,** London.

L. F. Smith was promoted to executive vice president, **Erie Meter Systems Inc.,** Erie, Pa. **N. A. Carlson Jr.** was made vice president and **W. B. Johnson Jr.** vice president in charge of sales.

A. O. Willis was named assistant general manager of **Curtiss-Wright Corp.'s** metals processing division in Buffalo, a newly created position.

John W. Jordan was made assistant to executive vice president-accounting, **United States Steel Corp.,** Pittsburgh. He was assistant comptroller of the corporation's American Steel & Wire Division, Cleveland.

L. Gerald Firth retired as vice president and director of research for **Firth Sterling Inc.,** Pittsburgh, after 39 years with the company.

Stephen Parey was made assistant purchasing agent of the Cleveland and Pittsburgh district of U. S. Steel Corp.'s **American Steel & Wire Division.**

John W. Auferoth, formerly with Pioneer Engineering & Mfg. Co., Detroit, was appointed plant engineer, **Hygrade-Atlas Inc.,** Simpson, Pa. **Robert A. Flynn,** formerly of Bendix Aviation Corp., was appointed plant superintendent.

E. A. Black was made vice president in charge of the marine divisions of **Pacific Car & Foundry Co.,** Seattle.

Richard L. Terrell, plant manager of the Cleveland Electro-Motive Division of **General Motors Corp.,** was transferred to the division's headquarters in La Grange, Ill., as works manager. He is replaced at Cleveland by **J. E. Hacker,** whose duties Mr. Terrell is assuming in La Grange.

Joseph Ohzourk was made factory manager of the Chicago die mold plant of **United States Rubber Co.** He replaces **Esper A. Petersen,** who remains with the company as a consultant.

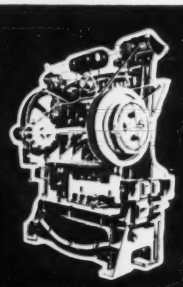
Elton J. Burgett was elected a vice president of **Quinby & Co.,** Rochester, N. Y.

Ralph M. Gattshall, who has been with the **Republic Rubber Division** of Lee Rubber & Tire Corp., Youngstown, for 31 years, retired. In 1936 he became Republic's first district manager and opened a new southern district with headquarters in Atlanta, his last position and location.

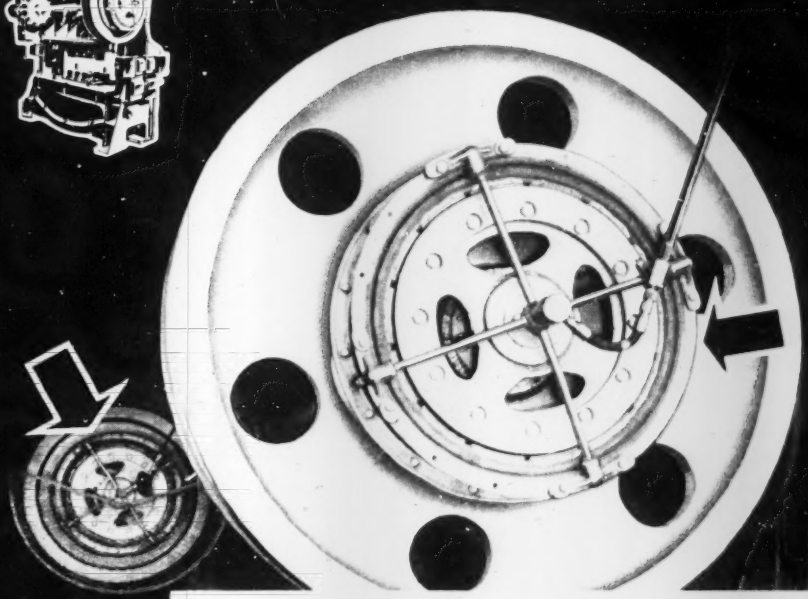
Cleveland-Cliffs Iron Co. appointed **J. S. Westwater** of Ishpeming, Mich., to the position of manager of Michigan mines. He succeeds **F. J. Haller,** who recently resigned to take over the duties of vice president, North Range Mining Co.

Lloyd D. Washburn was appointed manager of the newly created new products division of **Glowmeter Corp.,** North Tonawanda, N. Y. Before joining Glowmeter two years ago, he was a production engineer with Bell Aircraft Corp.

Joseph D. Brubaker replaces the



TYPICAL EXAMPLE OF FAWICK AIRFLEX APPLICATIONS ON MODERN PRODUCTION MACHINES



EXECUTIVE REMINDER FOR INCREASED PRODUCTION

Final profit figures reflect all types of production economies effected in industry, and one of the most important of these economies results from increased production.

Time after time in all kinds of processing and manufacturing, FAWICK AIRFLEX INDUSTRIAL CLUTCHES AND BRAKES have provided increased production on machines that were already considered highly efficient.

Your industrial production equipment performing cyclic operations can be readily equipped for increased production with performance-proved FAWICK units. The outstanding FAWICK ENGINEERING SERVICE is available to you, without cost or obligation, to help you investigate the advantages of FAWICK AIRFLEX CLUTCHES AND BRAKES as applied to your specific production machines.

FAWICK AIRFLEX DIVISION

FEDERAL FAWICK CORPORATION

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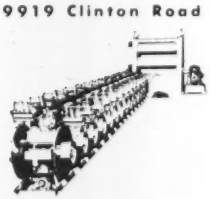


FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

OTHER FAWICK APPLICATIONS IN INDUSTRIAL PROCESSING

J. E. POOLE
. . . new duties at Liquid Carbonic

JOSEPH A. ANDERSON
. . . gen. mgr., AC Spark Plug

GEORGE A. HINCKLEY
. . . Automatic Transportation sales mgr.

late **A. L. Bingham** as treasurer and a director of Standard Horse Nail Corp., New Brighton, Pa.

Liquid Carbonic Corp., Chicago, appointed **J. E. Poole** manager of manufacturing and engineering, compressed gas division, responsible for design and operation of all Liquid gas plants. He was named chief engineer in 1947.

The wire and cable division of **Copperweld Steel Co.**, Glassport, Pa., promoted **J. A. Heidish** to assistant manager of production. His previous assignment was superintendent of the casting department.

Joseph A. Anderson was made general manager of the **AC Spark Plug Division** of General Motors Corp., Detroit. He succeeds **George Mann Jr.**, retired. Mr. Anderson has been works manager since 1940.

Supplementing his duties as vice president and director of **Electric Storage Battery Co.**, Philadelphia, **Roland Whitehurst** was made general manager, industrial products division.

Frank A. Peschl was made director of engineering, **Olin Industries Inc.**, East Alton, Ill.

George A. Hinckley was made sales manager, **Automatic Transportation Co.**, Chicago. For the last three years he has been sales manager for the New York factory branch and prior to that was with the sales department in Chicago. He succeeds **Robert M. Whitney.**

T. O. Armstrong, formerly with Westinghouse Electric Corp., was appointed assistant to the president of **Dumas Steel Corp.**, Pittsburgh. **Karl Adler** was promoted to general manager of sales, and **Rodney R. Burns** was made sales manager, Pittsburgh district.

OBITUARIES . . .

Joseph R. Gould, 63, president and founder of **Bronze & Aluminum Co.**, Springfield, Mass., died Oct. 16.

Ray A. DeVlieg, 67, who recently resigned as vice president in charge of manufacturing for **Nash-Kelvinator Corp.**, died in Detroit Oct. 15.

Alice G. Hansen, 48, president and founder in 1941 of **Pittsburgh Mill Steel Co. Inc.**, New York, died Oct. 18. A year after founding the Pittsburgh corporation, Miss Hansen became president also of Service Steel Corp.

Harold B. Thomas, 62, a founder of Elastic Stop Nut Corp. of America, died in Orange, N. Y., Oct. 23. Sales vice president until 1940, he resigned to enter consulting work in industrial product anaysis. In 1948 he became chairman of **Norma-Hoffmann Bearings Corp.**, Stamford, Conn., and left that post several months ago.

Samuel Burd, 80, owner and operator of **Burd Iron & Metal Co.**, Dayton, O., until six years ago, died Oct. 15.

William S. Rugh, former vice president in charge of sales, **Consolidated Mining & Smelting Co. of Canada Ltd.**, died Oct. 16 at his home in Montreal, Que.

George W. O'Keeffe, 53, assistant sales manager, Boston Works, **Allis-Chalmers Mfg. Co.**, Milwaukee, died Oct. 9.

Walter Giger, 57, an application engineer in the electrical section of **Allis-Chalmers Mfg. Co.'s** Norwood, O., Works, died Sept. 25 in Switzerland.

Joseph J. Stys, 47, vice president, **S C S Tool & Die Co. Inc.**, Milwaukee, died Oct. 14.

Frank Mossberg, 94, who had been president of **Mossberg Pressed Steel Corp.**, Attleboro, Mass., and inventor of many devices used in heavy machinery manufacturing, died Oct. 15.

Charles E. Morris, 64, secretary-treasurer, **Morris Machinery Co.**, Newark, N. J., died Oct. 20.

Neil J. Driscoll Sr., 61, regional sales manager for **Square D Co.**, Milwaukee, died Oct. 22.

Ernest Anheuser, 64, president, **Anheuser File Co.**, Milwaukee, died Oct. 21.

If Henry Hudson could see it now...

DELAWARE U·S·A VALLEY

To Henry Hudson who first explored it, the Delaware River was a possible passage to the wealth of the Indies. Little could he have foreseen that on the banks of this great river there would one day arise an industrial empire that would surpass even his wildest dreams of Eastern riches.

Delaware Valley, U.S.A. it has come to be known —America's fastest growing industrial area—a cross section of both the nation's industry and many of its best known names.

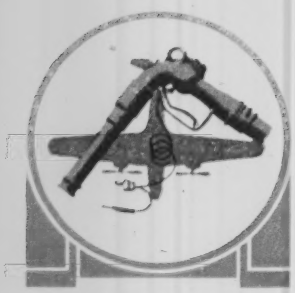
CF&I is proud that its steel and steel products mill at Claymont, Delaware is located in the Delaware Valley. Our future plans for expansion of production facilities will contribute still further to the development of this "valley of opportunity."

1971

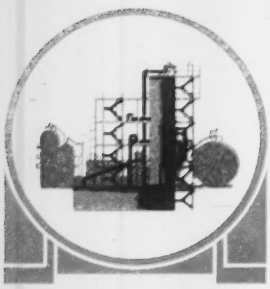
CLAYMONT STEEL

WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CLAYMONT, DELAWARE

CF&I



Fuel Pumping



Petroleum Refining

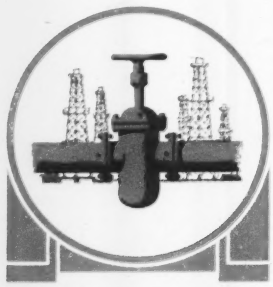
Chemical Processing

Electric Motors

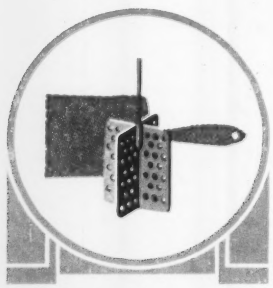
for every industry

When you need electric motors . . . in any rating, or frame type . . . one or a thousand . . . *always* look for the Fairbanks-Morse Seal. For over 120 years it has stood for the finest in manufacturing integrity to *all* industry.

Fairbanks, Morse & Co., Chicago 5, Illinois.



Pipe Line Pumping



Paint Manufacturing

Fairbanks-Morse explosion-proof motors for all installations where fire hazards exist.

FAIRBANKS-MORSE

a name worth remembering when you want the best

ELECTRIC MOTORS AND GENERATORS • DIESEL LOCOMOTIVES AND ENGINES • RAIL CARS • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

Frasse Opens Plant

Establishment of Hartford warehouse is major step in firm's expansion program

A WAREHOUSE was opened by Peter A. Frasse & Co. Inc., New York, on Locust street in Hartford, Conn. The new operation will be devoted to distribution of alloy, stainless and cold-finished carbon steels as well as alloy and stainless tubing in Connecticut and the New England area. Carbon tubing also will be distributed in Connecticut.

The warehouse is serviced by the latest in materials handling equipment, including industrial trucks and mobile electric boom hoists. Modern cutting equipment and a production line system of order handling have been set up to facilitate maximum speed and efficiency.

The new plant's features include electrically operated steel rolling doors and an integral intercommunication system permitting instant contact with any work location. Adequate loading facilities are available for customer use whenever quick pickup is desired. Parking areas adjoin the building and the balance of the Frasse tract is available for future expansion.

Enlarging of the Frasse organization in the Hartford area constitutes a major step in the company's program for expansion and modernization. Frasse has warehouse offices in New York, Philadelphia, Buffalo, Syracuse, Hartford and Lyndhurst, N. J., and auxiliary sales offices in Rochester, N. Y., and Baltimore.

Orban Moves Cleveland Office

Kurt Orban Co. Inc., New York, moved its Cleveland office and service center to larger quarters at 1256 E. 12th St. The company is a distributor of German-made machine tools.

Valvemaker Expands Capacity

Facilities for producing steel and iron valves at its Carthage, O., plant are being expanded by Lunkenheimer Co., Cincinnati. Steel and iron castings will be supplied to Lunkenheimer specifications by outside sources, which necessitates adjustment in the foundry working force and allows Lunkenheimer personnel to devote their full time and efforts to the production of valves.

Altoona Plant Boosts Output

Butcher & Hart Mfg. Co. is turning out a steadily increasing volume of lock washers, snap rings and other products at its new plant in Altoona, Pa. Electroplating machinery is still to be installed in the plant.

Keystone Installs Press

A 1250-ton aluminum extrusion press, manufactured by Watson-Stillman Co., Roselle, N. J., was installed in the plant of Keystone Alloys Co., Derry, Pa. With this press, Keystone will extrude aluminum sections used in the manufacture of its storm-screen doors, storm windows and casement storm windows.

Inland Mfg. To Build Addition

Inland Mfg. Division, General Motors Corp., will build a 165,000-sq-ft addition to its plant at Dayton, O., at a cost of about $1.2-million. The plant will be used for rubber processing operations.

Warehouse Appoints Agent

Lapham-Hickey Co., Chicago, iron and steel distributor, appointed Industrial Products Sales Inc., Cleveland, as its representative in that territory.

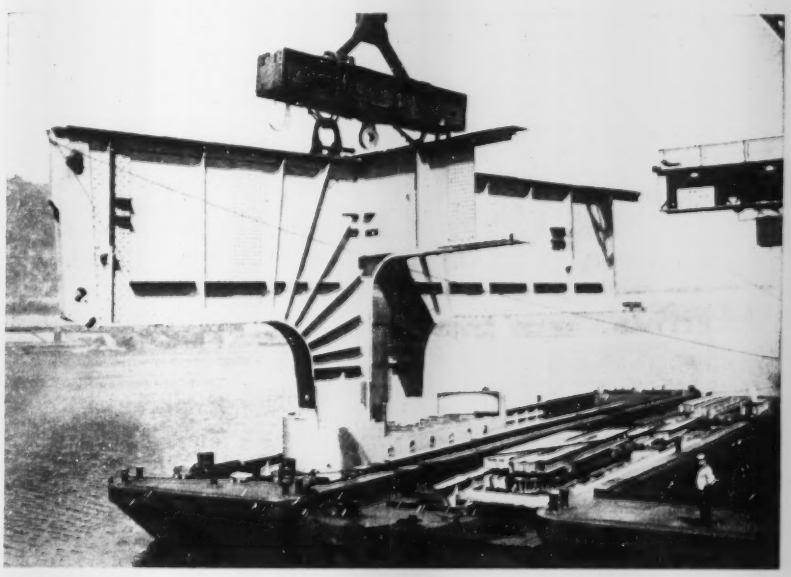
Carpenter Steel Opens Branch

Carpenter Steel Co., Reading, Pa., opened its warehouse and office building at 4152 N. 35th St., Milwaukee. E. P. McCahan is branch manager.

Enters Enameling Field

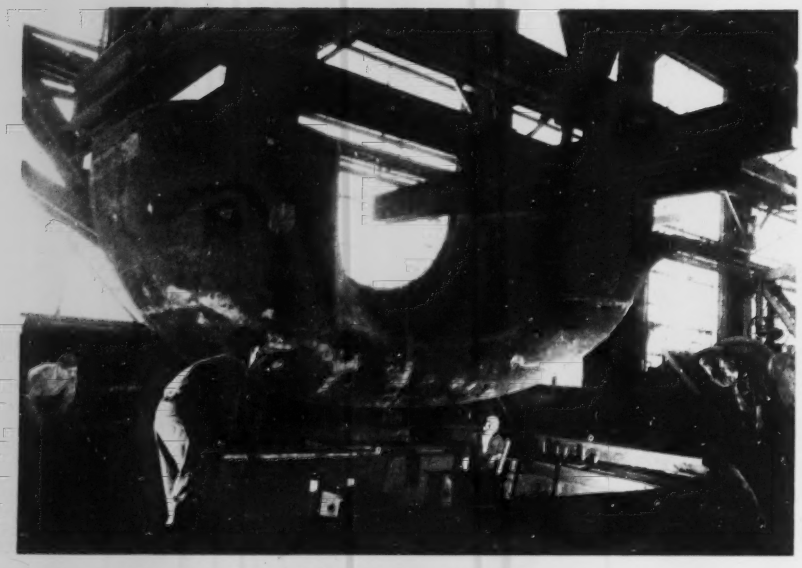
A large-capacity plant that will produce architectural porcelain enamel on steel products is under construction by Avondale Marine Ways Inc., Avondale, La. All the enameling equipment, including enamel spray machines, ball mills, pickling tanks, driers and furnace, will be furnished by Engineering Division, Ferro Corp., Cleveland, producer of porcelain enamel frit and allied industrial equipment. The plant represents an initial in-

(*Please Turn to Page* 68)



T-Formation Will Help Beautify TVA Bridge

This 34-ton star girder for Tennessee Valley Authority's bridge at the Chickamauga river dam is shown being loaded onto an Ohio river barge alongside the plant at Ambridge, Pa., of American Bridge Division, U. S. Steel Corp. The girder was fabricated at the plant which will supply 18 of these members for the 3458-foot bridge which will require 4500 tons of structural steel



GE Fashioning Hood for Powermaker

Foundrymen of General Electric Co.'s Turbine Division at Schenectady, N. Y., are shown lifting a rough-finished core from the pit where it was molded. This 120,000-lb core is a mixture of sand, clay and pitch and will form the inside contour of a casting which will be the upper hood of a turbine rated 100,000 kva. Finished hood will have enough space to contain a small apartment

(*Continued from Page 67*)

vestment of $500,000 and will be ready for operation in early 1954.

Bend Iron Works To Expand

Bend Iron Works, Bend, Oreg., plans to build a semimechanized foundry, steel warehouse, scrap shed and other facilities. H. A. Pyzdrowski is manager.

Emil Gairing Inc. Formed

Emil Gairing organized a new corporation, Emil Gairing Inc., 10239 Puritan Ave., Detroit 38, as consultant, designer and builder of production cutting tools and component parts. Emil Gairing, founder and former president of Gairing Tool Co., that city, is president of the new firm.

May Build Pipe and Tube Mill

Plans for construction of a $1.7-million steel pipe and tube mill in Vancouver, B. C., the first of its kind in western Canada, were announced by agents for Richard M. Reiner, founder of a similar industry in Chile. Construction is expected to start within a few months.

Metal Stamper Boosts Output

Angell Mfg. Co., Dayton, O., will expand its metal stamping operations at a second location in that city. The firm has leased 12,000 sq ft of manufacturing space at 242 Leo St.

Airframe Supply Gets Agency

North American Philips Co. Inc., Mt. Vernon, N. Y., appointed Airframe Supply Co., Akron, as sales agent to handle its industrial radiographic x-ray equipment in all states east of the Mississippi.

Neptune Sells Subsidiary

Neptune Meter Co., New York, sold its subsidiary, Rensselaer Valve Co., Troy, N. Y., to an investment group headed by David Berdon and Jay Levine, New York. Sale is part of a program to concentrate Neptune's entire efforts in the water works field on the production and sale of meters and meter parts. Neptune also makes meters for measuring liquids in the petroleum, chemical, food and other industries.

Rensselaer will expand its facilities for producing large water works valves and hydrants, says Lyman C. Thunfors, president. He was vice president and general manager of Rensselaer when it was affiliated with Neptune.

Seaboard Coil Moves Plant

Seaboard Coil Spring Corp. moved into its $750,000 plant at 15001 S. Broadway, Gardena, Calif. The first anniversary of Seaboard's merger with Associated Spring Corp., Bristol, Conn., was observed Oct. 1.

Arthur D. Little Opens Branch

Arthur D. Little Inc., Cambridge, Mass., industrial research and engineering firm, will open a midwest liaison office in the Board of Trade building, Chicago. John R. Kirkpatrick is manager of the office.

Minnesota Mining Names Agents

Minnesota Mining & Mfg. Co., St. Paul, appointed as distributors for its barrel finishing abrasive chips, compounds and equipment: Micro Deburring Co., Chicago; Mechanical Finishing Co., Cincinnati; Deburrco Inc., Philadelphia; Gerell Mfg. Co., Cleveland; Sundmark Supply Co., Los Angeles; Tumbling Products Inc., Indianapolis; Metal Parts Processing Co. and Metal Finish Inc., Newark, N. J.; M. E. Baker Co., Cambridge, Mass.; Mosher Co., Chicopee, Mass.; and Precision Tumbling & Supplies Co., Stratford, Conn.

Alcoa Sells Furniture Plant

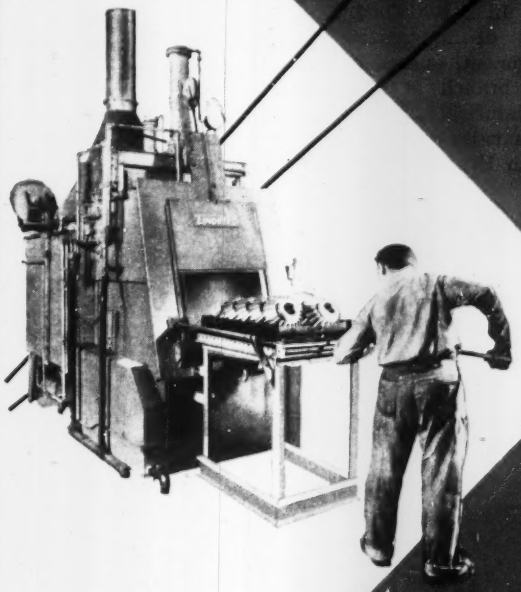
Aluminum Co. of America, Pittsburgh, sold its furniture producing plant in Jamestown, N. Y., to Surplus & Salvage Co. Inc., that city. The latter firm will resell or lease the property to some company for use as a furniture manufacturing operation.

Power Facilities Cataloged

The story of electric power—basic to all economic activity—is told in 11 regional maps and 6 enlarged-scale maps of congested areas, revised as of June 30, 1953, and available from the Publications Division, Federal Power Commission, Washington 25, at $5 the

5 FURNACES IN ONE

the LINDBERG Carbonitriding Furnace



Yes, it's many furnaces in one! It's designed not only for carbonitriding . . but also for hardening, carburizing and carbon restoration. It's self contained . . it's easy to maintain!

10 reasons why Lindberg Carbonitriding Furnaces are better:

1. Heating is by new type, gas-fired, vertical radiant tubes. They weigh only 29 pounds each . . can be changed in two minutes. Just lift out the old one, and lower the new one in its place.
2. Vertical radiant tubes last longer . . often two or three times as long.
3. Quench tank is built-in . . no costly excavation or piping necessary. Distortion is minimized because quenching takes place within furnace structure, and heated work is never exposed to outside air.
4. Quench tank has fin type oil cooler . . maintains oil at proper temperature for quenching.
5. Specially designed purge chamber purges work loads before they enter heating chamber.
6. Special check-light system tells you where charge is at any given time.
7. Control of heating and quenching cycle is automatic. Uniform case depth is assured because each charge remains at heat same length of time.
8. Depending on your production requirements, Lindberg Carbonitriding Furnaces are made for automatic, semi-automatic, or manual charging.
9. You're not experimenting with Lindberg Carbonitriding Furnaces. They've been tested . . under three years of rough operating conditions.
10. The famous Lindberg "Hyen" generators which supply atmosphere for Lindberg Carbonitriding Furnaces are instantly adjustable for many different types of atmospheres.

For full details, ask for bulletin #241.

LINDBERG FURNACES

Lindberg Engineering Company • 2441 West Hubbard Street • Chicago 21, Illinois

set. Order number for the set is FPA-M-38. It shows the location of all generating stations of 1000 kilowatts and over and all transmission lines of 22 kilowatts and above. Accompanying the maps is a list of owners of the facilities.

Plans Coaxial Cable Plant

Andrew Antenna Corp. Ltd., newly formed subsidiary of Andrew Corp., Chicago, will build a branch coaxial cable manufacturing plant in Toronto, Ont. The factory is expected to go into production early next year, says J. W. McLeod, Canadian manager.

Colormakers Form Division

Manufacturers supplying the porcelain enamel industry with color oxides formally organized as the Color Manufacturers Division of Porcelain Enamel Institute, Washington. W. F. Wenning of Ceramic Color & Chemical Co., New Brighton, Pa., was elected chairman. Companies represented at the organizational meeting in addition to Ceramic Color were: Chicago Vitreous Enamel Product Co., Cicero, Ill.; B. F. Drakenfeld & Co. Inc., New York; Ferro Corp. and Harshaw Chemical Co., Cleveland; Pemco Corp., Baltimore; Shepherd Chemical Co., Cincinnati; and Vitro Mfg. Co., Pittsburgh.

Sperry Pushes Sales Abroad

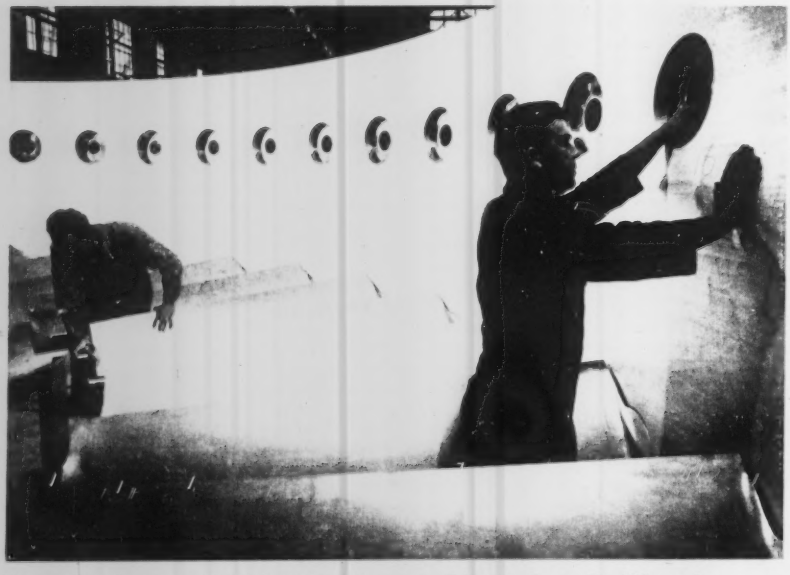
Sperry Products Inc., Danbury, Conn., manufacturer of ultrasonic and electronic equipment, appointed Resources & Facilities Corp., New York, to develop license and sales arrangements of its patented products in Europe and the Far East.

Equipmentmaker Opens Branch

Ipsen Industries Inc., Rockford, Ill., manufacturer of automatic heat treating equipment, opened a sales and service branch at 146 E. Front St., Plainfield, N. J. Alfred E. Stone is sales engineer at this office; John Keegan, service engineer.

Signode Dedicates Plant

Signode Steel Strapping Co., Chicago, dedicated its new $1.5-million plant in Weirton, W. Va., to celebrate the company's 40th anniversary. John W. Leslie is chairman of the board; Arthur F. Armstrong, Weirton plant manager.



Westinghouse Builds Hurricane Plant for California

Cast steel blades, shown above, each weighing two-thirds of a ton, are only a ripple in the "muscles" of an Air Force wind tunnel being constructed by Westinghouse Electric Corp. at its Sunnyvale, Calif., plant to churn up air speeds up to 2500 miles an hour. Between the rows of stationary blades, inserted in the stator ring, other disc-mounted blades will rotate 600 times per minute

Parker To Build in Toronto

Parker Rust Proof Co. of Canada Ltd., subsidiary of Parker Rust Proof Co., Detroit, purchased a site in Toronto, Ont., for erection of a new plant with 15,000 sq ft of floor space. The firm is a pioneer in metal surface treatment.

Radov Purchases Plant

M. P. Radov Corp., Erie, Pa., purchased the former Union Ice Corp. plant in that city. The purchase was announced by Morris P. Radov, president, who also heads Independent Iron & Metal Co., Erie. The purchase will enable the firm to co-ordinate activities on the two adjacent properties.

Boiardi Steel Changes Name

Boiardi Steel Corp., Milton, Pa., changed its name to Milton Electric Steel Corp. All officers, personnel, sales and production facilities remain the same.

Reliance Opens Duluth Branch

Reliance Electric & Engineering Co., Cleveland, opened a branch office at 120 N. Fourth Ave., Duluth. J. A. Ritt is the field sales representative in that territory for Reliance motors, motor drives and associated electrical equipment.

Alcoa Appoints Distributor

Aluminum Co. of America, Pittsburgh, appointed Hamilton Steel Co., Cleveland, as a second distributor of its aluminum products for that area. Hamilton is a subsidiary of Federated Steel Corp., Pittsburgh. Donald C. Lott is president of Federated while Earnest W. Harwell is president of Hamilton Steel. Williams & Co. Inc. will continue to distribute Alcoa products in the Cleveland area.

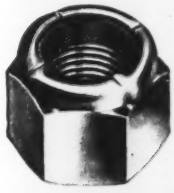
Stark Electronics Expands

Stark Electronics Ltd., Ajax, Ont., is expanding its operations with the acquisition of two adjoining buildings containing 26,000 sq ft of floor space. This increases total floor space to 58,000 sq ft. The company plans to spend more

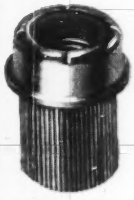
(*Please Turn to Page* 73)

self-locking fasteners

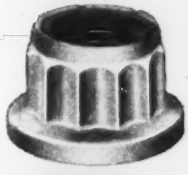
Elastic Stop nuts



HEX NUT



SPLINE NUT

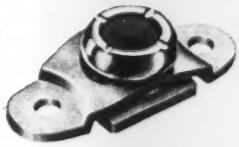


HIGH TENSILE NUT

CLINCH NUT

1200° F. HIGH-TEMP. NUT

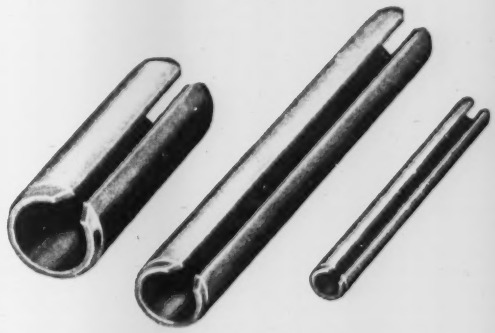
GANG CHANNEL NUTS



FLOATING ANCHOR NUT

Every major aircraft now being assembled relies on the vibration-proof holding power of ELASTIC STOP nuts. Only ESNA manufactures a complete line of all types and sizes of self-locking nuts.

Rollpins



dia. from 1/16" to 1/2"

Rollpins are slotted, tubular steel, pressed-fit pins with chamfered ends. They drive easily into holes drilled to normal tolerances, compressing as driven. Extra assembly steps like hole reaming or peening are eliminated. Rollpins *lock* in place, yet are readily removed with a punch and may be reused.

Cut assembly costs by using Rollpins as set screws, positioning dowels, clevis or hinge pins. Specify them in place of straight, serrated, tapered or cotter type pins.

ESNA

ELASTIC STOP NUT CORPORATION OF AMERICA

ROLLPIN TRADEMARK

Mail Coupon for Design information

Elastic Stop Nut Corporation of America
Dept. N34-1160, 2330 Vauxhall Road, Union, N. J.

Please send me the following free fastening information:

- ☐ Elastic Stop Nut Bulletin
- ☐ Rollpin Bulletin
- ☐ AN ESNA Conversion Chart
- ☐ Here is a drawing of our product. What fastener would you suggest?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

To Avoid Fluid Line Troubles

DEPEND UPON THE HANSEN REPRESENTATIVE

for the know-how you need... when you need it

When you need help—and need it in a hurry—it will really pay you to know the Hansen representative in your area. In dozens of plants, it's almost routine procedure to call him—either when actual troubles arise—or when fluid line circuits are being planned or altered.

From his years of experience with almost every type of hook-up, he can tell you what works—and why it does. Frequently he can make suggestions which will quickly clear up your difficulties.

Quick-connective couplings are, of course, his main business—but so are fluid line problems. Make use of his know-how—it's yours for the asking.

H. U. ROGNESS
H U Rogness, Inc., Minneapolis
Offers many years of experience in servicing and specifying equipment for hydraulic and pneumatic lines in plants of manufacturers, foundries, food processors and other industrial firms.

ELLIS AKIN
Ellis Akin Engineering Co.
Kansas City, Missouri
Provides specialized engineering service on pneumatic and hydraulic lines in the Kansas, Nebraska, Western Iowa and Western Missouri area.

MALCOLM B. STURGIS
Sturgis Equipment Co., St. Louis
Serves widely diversified group of industries on problems related to pneumatic and hydraulic equipment, including filters, regulators, lubricators and quick connective couplings.

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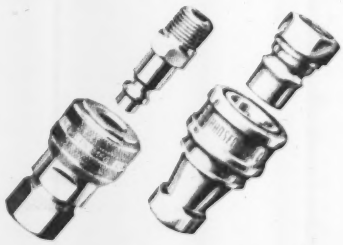
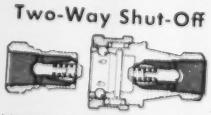


QUICK-CONNECTIVE FLUID LINE COUPLINGS

1. QUICK CONNECTION AND DISCONNECTION **2. INSTANT AUTOMATIC FLOW OR SHUT-OFF**

One-Way Shut-Off

Two-Way Shut-Off



ALSO STRAIGHT-THROUGH QUICK-CONNECTIVE COUPLINGS
Send for Catalog!

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

(Continued from Page 70)

than $100,000 altering the buildings to increase production of meters and other products.

Du Pont To Build in Buffalo

A $1-million construction program at the E. I. du Pont de Nemours & Co. Inc. plant at Niagara Falls, N. Y., was announced. The program includes an office building and a large warehouse.

Lindberg Moves Division

Lindberg Engineering Co., Chicago, moved its Air & Hydraulic Division from the main plant to 225 N. Laflin St., that city, to increase facilities for the production of air and hydraulic cylinders and related equipment.

Rice Pump Opens New Plant

Rice Pump & Machine Co., manufacturer of centrifugal pumps, die filers, profile grinders and sprue cutters, moved into its new plant at 400 Park Ave., Belgium, Wis., thereby tripling its former floor space.

Vanadium Expands Mill

Vanadium Corp. of America, New York, has started operation of a roaster for ore-bearing uranium and vanadium at its Naturita, Colo., mill. The roaster, the third installed at Naturita, increases by 80 per cent the mill's capacity.

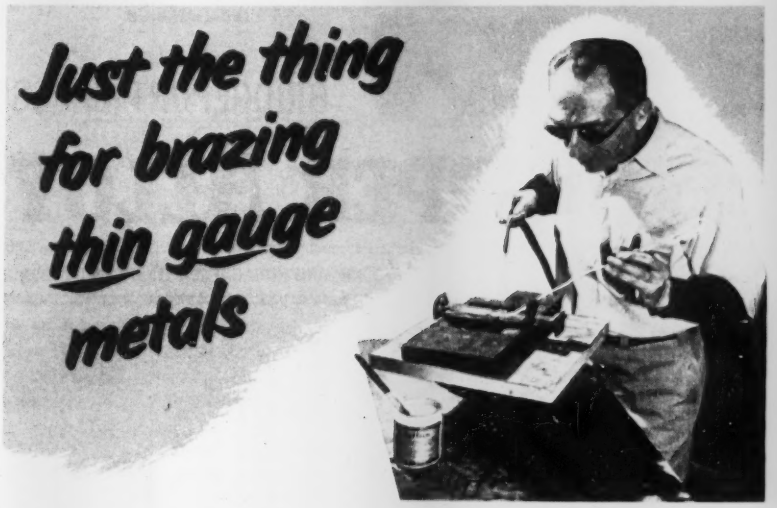
Solvent Firm Names Agents

John B. Moore Corp., Nutley, N. J., appointed as sales agents for its solvent products: Pioneer Salt Co., Philadelphia, and Donner & Co., Winnipeg, Man. The company's sales in lower New York state and New York city will be handled by staff engineers under the supervision of I. Q. Sarlin.

Wiesner-Rapp Buys Firm

Wiesner-Rapp Co. Inc., manufacturer of special industrial machinery, Buffalo, purchased all the stock of Allan Herschell Co. Inc., North Tonawanda, N. Y., manufacturer of amusement rides. Arthur

(Please Turn to Page 76)



EASY-FLO 45

With its low working temperature of 1145° F, EASY-FLO 45 is just what the doctor ordered for joining thin gauge metals. It brazes them without danger of damage from overheating. The low flow point also cuts a big chunk off heating costs.

And here are more good reasons why this silver brazing alloy is so widely used for joining thin gauge metals. EASY-FLO 45 is exceptionally free flowing. Because of this it penetrates into and over the entire joint area the instant its low flow point is reached. Results—high strength, liquid and gas tight joints—joints so clean they seldom need finishing. Here's a sample — a directional coupler from the line of microwave test equipment made by the Polytechnic Research & Development Co. Inc., Brooklyn, N. Y.

Curved and straight sections of rectangular brass tubing are brazed along a common side wall and flanges are attached with 1/16" EASY-FLO 45 wire. Bodies are finished with baked gray enamel and flanges are nickel plated. The clean EASY-FLO 45 joints greatly facilitate finishing.

GET FULL EASY-FLO 45 DETAILS IN BULLETIN 20---
Write today for a free copy.

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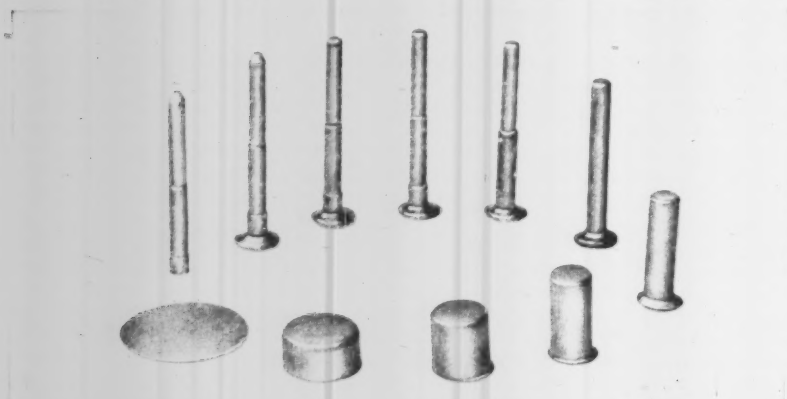
BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Progressive stages in drawing of brass sac protectors for Snorkel pen. Courtesy W. A. Sheaffer Pen Co., Fort Madison, Iowa

Progressive Drawing on Eyelet Machines Makes Sac Protector for Snorkel Pens

A small tube makes it possible for Sheaffer's new Snorkel fountain pen to breathe in ink without immersing the pen point into the ink bottle. This device eliminates the messy chore of wiping the point after filling.

Heart of the new pen is the brass sac protector which is drawn by Advance Stamping Company, Detroit, Michigan, from brass strip supplied by Bridgeport Brass. The protector, about two inches long and open at one end, fits over the rubber sac which holds the ink supply. The sac and the tube of the Snorkel pen fit into the open end and are retained by a rubber bushing.

The Snorkel Principle

In addition to serving as a protective cover for the sac, the brass sac protector performs a vital role in the operation of the pen. The sac protector is delivered to the manufacturer completely drawn except for the threads which are rolled on at the pen plant. These threads work within another covering brass tube connected to a small knob at the end of the pen barrel. When the knob is turned, the brass sac protector moves downward in the barrel pushing the snorkel tube out beneath the pen point. The tube is inserted in the ink and a downward stroke of the plunger fills the pen. The knob on the top of the barrel is turned in the opposite direction and the tube of the Snorkel pen retracts, leaving the pen ready for writing.

Correct Alloy Vital

The brass sac protector for the Snorkel pen is drawn from Bridgeport rich low brass (85% copper, 15% zinc). This material is .0071 ± .0005 and is supplied in 1¾" strip form. This alloy was chosen because it meets the requirements for eyelet machine operations and also simplifies finishing. It has a fine grain structure which assures a smooth surface. Finishing costs are therefore held to a minimum. This fine grain also imparts strength to the material so that it can withstand stretching during the forming and drawing.

Metal for eyelet machine operations must be high in ductility. Not only must it have the correct temper and grain size, but the metal must have uniformity of anneal and be free from imperfections. Eyelet operations are so severe that poor quality metal results in interrupted production and excessive spoilage.

Economy of Eyelet Machine Operations

Since eyelet machine operations include such stages as blanking, cupping, drawing, piercing and trimming, tool costs are higher than for single press methods. But with long runs, the higher tool and setup costs are absorbed by the constant stream of finished pieces that leave the eyelet machine at low unit cost. With properly designed tools and good lubricants to reduce friction between the metal and the dies, progressive operations can be performed without the danger of too much hardening of the metal during the early stages.

Other important advantages of eyelet machine operations, when the correct copper-base alloy is used, are the elimination of intermediate anneals and of handling separate batches of work for each stage of drawing and forming. Parts are not subject to injury or accumulation of dirt while waiting for available presses.

The sac protector of the pen is an excellent example of eyelet machine production — combining good design, careful processing methods and selection of the correct alloy. The progressive stages of the sac protector drawing are illustrated. After threading, the finished protectors are chrome plated to complement the high finish of the pen and to produce a wear-resistant surface.

Fast production of metal products on automatic machines calls for copper-base alloys of the composition, temper, and grain size which will give the best results with a minimum of finishing cost and wastage. Bridgeport Laboratory will be glad to help our customers in specifying metals that are designed for their particular equipment and their manufacturing methods. Please get in touch with our nearest Bridgeport Office for your metal requirements and for assistance in metal problems. (133)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

COPPER AND COPPER ALLOYS vs. SODIUM CHLORIDE SOLUTIONS (Cont.)

Impurities that are Protective

The discussion and data in preceding issues of this column have been confined to essentially pure sodium chloride and serve as a useful yardstick in comparing the behavior of sodium chloride containing various impurities.

Trace quantities of various impurities in naturally occurring sodium chloride, brines and industrial salt solutions have a very marked effect on the location and extent of corrosion which may be encountered.

Dense adherent, protective deposits of calcium carbonate, calcium sulphate and other salts may form on metal surfaces when their concentration is sufficiently high in sodium chloride solutions. Also, a protective layer of sodium chloride may form when the concentration of sodium chloride is high. Substances of low solubility such as silica, barium sulfate, ferric hydroxide, etc., form deposits or films which lead to appreciable and often very pronounced corrosion inhibition.

It has been repeatedly observed that when adherent thin films of hydrated iron oxides have formed on copper and some copper alloys that very low rates of corrosion took place.

Tests conducted in 0.5 normal sodium chloride solutions at 175°F showed that copper and various copper alloys corroded at appreciably lower rates when the solution contained about 0.18-0.06 ppm of ferric hydroxide calculated as iron as compared with a solution containing 0.08-0.02 ppm iron.

This iron concentration (0.1-0.2 ppm) was sufficient to produce an adherent, protective iron-rich film on the metal surface. The rate of corrosion beneath this film generally being less than when the film was thinner or entirely absent.

The data given in Table I show that the rate of corrosion was reduced from 0 up to 80% depending upon the alloy.

Profilometer Tracer is said to measure surface roughness on internal tapers, across internal shoulders and on surfaces that can only be reached by a tracer with a doglet beam. Is also useful on any other internal or external surface where the geometry of the work permits, and where the part can be mounted with work surface horizontal. **No. 1346**

Metal Polishing and Drying Compound of ground, cleaned and milled corn cobs is said to be used three or four times longer than sawdust as a polisher and absorbent agent in drying metal parts. Available in five standard mesh sizes, it can be processed oblong or spherical in shape. **No. 1347**

TABLE I

Corrosion of Copper and Several Copper Alloys in 0.5 N Sodium Chloride Solutions of Low Ferric Hydroxide Content vs. Higher Ferric Hydroxide Content.

Alloy	*Low Ferric Hydroxide*	*Higher Ferric Hydroxide*
Cu 99.9, P 0.03	0.0019 ipy	0.0009 ipy
Cu 98.0, Si 2.0	0.0026	0.0006
Cu 96.9, Si 3.0	0.0014	0.0004
Cu 91, Si 2.0, Al 6.9	0.0010	0.0002
Cu 63, Zn 37	0.0011	0.0011
Cu 59, Zn 39, Pb 1.7	0.0013	0.0008
Cu 69.6, Zn 30.4	0.0015	0.0007

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Chamfer Micrometer is said to give accurate direct micrometer reading of end diameters of chamfers up to one in., from 0° chamfer to 90° included angle maximum chamfer. Master check bar with known end diameter and chamfer is furnished for checking calibrations. **No. 1341**

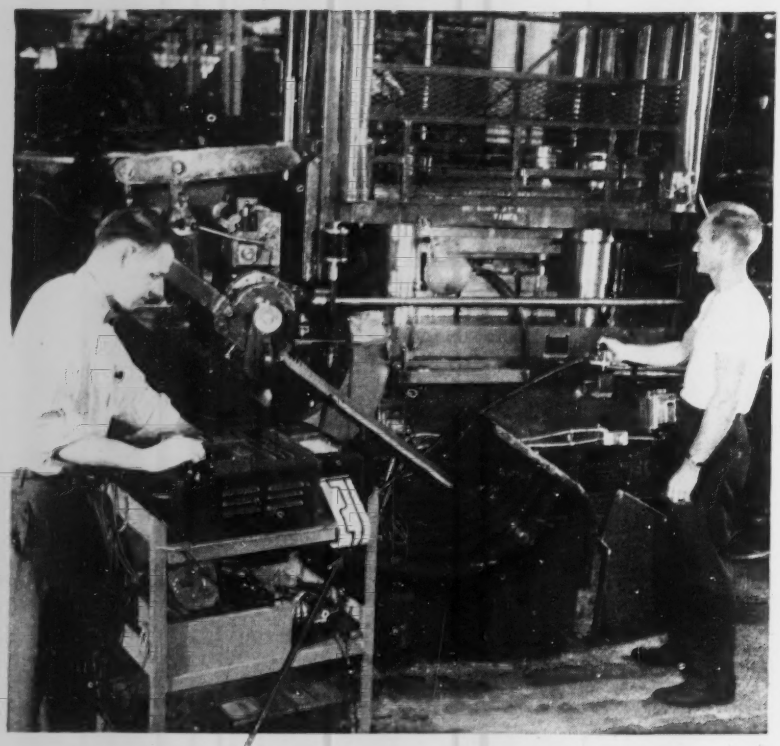
Automatic Pick-up Tweezer, all stainless steel, is said to pick up small, oddly shaped, or hot parts easily. Depressing top plunger causes three hooked spring steel fingers to flare out from tip. Releasing plunger causes them to grab and hold object. Fingers extend to 1¼ in. between tips. Tool comes with pocket clip. **No. 1342**

Metal Protective Wrap is a coated product that sticks only to itself. Package is sealed when wrap is placed over parts and pressed together. Is said to make tight dustproof, water-repellent jacket that protects parts and fine finishes. Wrap can be marked for identification. **No. 1343**

Portable Fluorescent Inspection Lamp utilizes two or four power magnification lens straddled by twin white fluorescent lamps for intense, glare free and heat free light. Unit is said to be instantly convertible for Ultra-violet radiation and is rated at 7500 hrs. life which manufacturer claims represents three years normal use. **No. 1344**

First Aid Burn Kits contain automatic spray dispenser of an antiseptic anaesthetic burn treatment and an assortment of bandages and compresses. Large size also includes treatment in form of greaseless, water soluble ointment. Steel carrying cases have retractable hangers for wall mounting. **No. 1345**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities (Advertisement)



CHECKS PRESS LOADING

with Brush Recording Analyzer

Here, in the plant of a large manufacturer of automotive parts, periodic checks are made on this 150-ton mechanical press to spot possible overloading. With resistance-type strain gages mounted on the press, the signal is amplified and recorded by the Brush Strain Analyzer... producing an *immediate chart record* of press strain.

Since measurements can be made quickly and easily, the Brush Strain Analyzer furnishes a *practical method* of detecting overloading and avoiding costly breakdowns, and lengthening press life.

You can use Brush Recording Analyzers to save time and solve problems... in measurement of strain, torque, vibration, pressure, d-c or a-c voltages or currents, and other variables. Brush representatives are located throughout the United States. In Canada: A. C. Wickman, Limited, Toronto. For bulletin write Brush Electronics Company, Dept. PP-11, 3405 Perkins Avenue, Cleveland 14, Ohio.

BRUSH ELECTRONICS COMPANY

INDUSTRIAL AND RESEARCH INSTRUMENTS
PIEZO-ELECTRIC MATERIALS • ACOUSTIC DEVICES
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formerly
The Brush Development Co.
Brush Electronics Company
is an operating unit of
Clevite Corporation

(Continued from Page 73)

J. Wiesner is the new chairman of the Herschell firm. Lyndon A. S. Wilson is president and general manager. Allan Herschell will be operated by Wiesner-Rapp as a separate company.

Holmes Foundry To Expand

Holmes Foundry Co. Ltd., Sarnia, Ont., awarded a contract for erection of a $1-million plant addition. W. B. Millholland, vice president, made the announcement.

Dubl-L Steel Moves Office

Dubl-L Steel Co. moved its offices to larger quarters at 343 S. Dearborn St., Chicago 4.

AISC Opens Branch Offices

American Institute of Steel Construction, New York, opened branch offices in Union Trust building, Pittsburgh, under direction of A. R. Wright, and in the Marine Midland building, Syracuse, N. Y., under the direction of E. W. Cradt.

Ives To Build Branch Plant

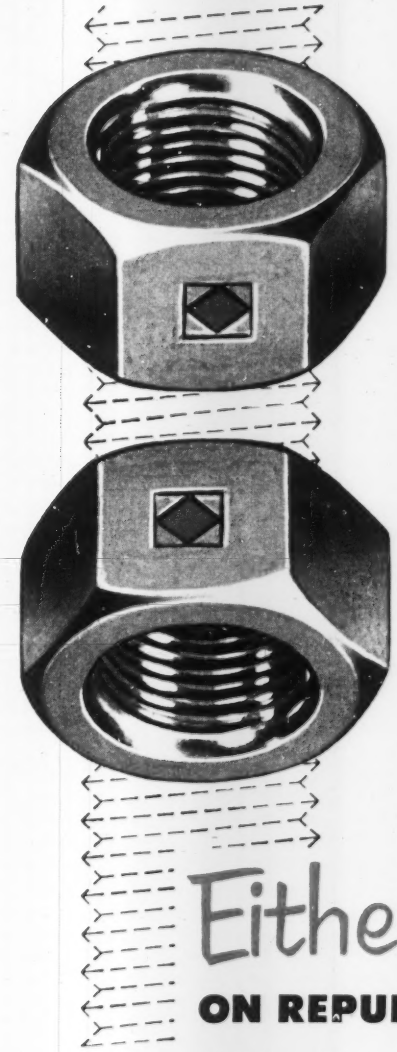
H. B. Ives Co., New Haven, Conn., will build a branch plant at Hamden, Conn., to manufacture parts for latches and other builders' hardware. Finishing and assembly operations will continue at its main plant in New Haven.

Pipe Machinery Names Agents

Gage Division, Pipe Machinery Co., Cleveland, appointed as distributors: Tool Crib Inc., Minneapolis, and Harwood Supply Co. Inc., East Rochester, N. Y.

Bliss Acquires Die Supply

E. W. Bliss Co., Canton, O., acquired Die Supply Co., Cleveland, manufacturer and distributor of diemakers' supplies for the metalworking industry. Newly elected officers of Die Supply include: H. U. Herrick, president; J. H. Tredinnick, executive vice president; W. H. Garrison, treasurer; F. J. de Lorme, secretary. These officers hold corresponding positions in the Bliss organization. John



Either end is "UP"

ON REPUBLIC UPSON "NYLOK" NUTS

Here's an advantage that saves you man-hours and trouble on your assembly lines . . . no need to turn a Republic Upson "Nylok" Lock Nut end-for-end to get it right-side up. Screw them on either way . . . they go on easily, *stay* put even under severe vibration, and come off easily when you want them off. Ready to *re*-use, too.

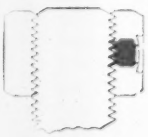
Tell us the sizes you are interested in . . . we'll send samples of Republic Upson "Nylok" Nuts . . . the lock nut with the nylon pressure plug.

Light series tapped ¼" thru ¾"
Light thick series tapped ¼" thru ½"
Regular sizes tapped ¼" thru ½"
Heavy series tapped ¼" thru ½"

REPUBLIC STEEL CORPORATION
Bolt and Nut Division • CLEVELAND 13, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

12 WAYS BETTER

Assemble from either end	No special tools
Can be re-used	One piece
Non-galling	Ideal for mechanical feeding
Best wrenching characteristics	No lubricant needed
Won't damage threads	Cold-forged
No special know-how	Lock in any position



Here's how the "Nylok" principle works

A nylon plug inserted in one of the sides of the cold-forged nut forces the nut tightly against the opposite threads as the nut is turned on.

*U. S. Pat. Numbers 2,462,603 and 2,450,694 and pending application

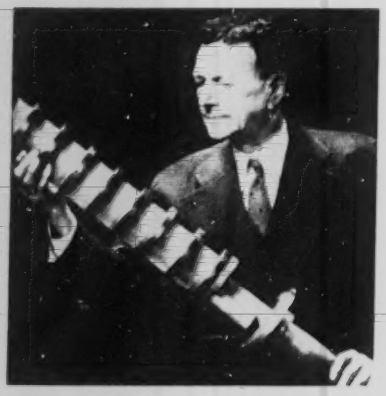
Republic
REPUBLIC STEEL
UPSON QUALITY BOLTS AND NUTS

R. Fitzsimmons is chairman of the board; Warren Fitzsimmons, factory manager; Carl J. Theken, assistant secretary and assistant treasurer.

Noted Scientist Honored

Dr. W. D. Coolidge, director emeritus, General Electric Research Laboratory, Schenectady, N. Y., was honored recently by his friends and associates on the occasion of his 80th birthday.

He is noted chiefly for his discovery in 1908 of a means of making a tough metal, tungsten, into



DR. WILLIAM D. COOLIDGE
. . . x-ray tube fascinates him

an extremely pliable one which could be drawn into wire 1/16 the diameter of a human hair. Subsequently, he extended this new knowledge by developing an x-ray tube of a type virtually in universal use today. He has been associated closely with atomic energy developments since early in 1941 and helped organize the laboratory at the Hanford Works, the plutonium-producing plant near Richland, Wash.

As of today, Dr. Coolidge has received 83 patents for his inventions and has been the recipient of most of the awards, honors and degrees the world can give a distinguished scientist. He is one of the founders of four major industries: Electronics, lamps, man-made cutting tools and x-ray.

McCaskey Merges with Victor

Stockholders of McCaskey Register Co., Alliance, O., approved a proposed merger with Victor Adding Machine Co., Chicago. Victor will operate the two plants in Alliance and one in England as its McCaskey Division.

Form Warehouse Steel Firm

William C. Hughes, president, Bright Steel Corp., New York, a warehousing firm, and his associates organized Albany Hi-Grade Steel Co. Inc., Albany, N. Y. They acquired substantially all of the property and assets of a corporation formerly named Albany Hi-Grade Steel Corp. Management of the new company will be in the hands of Walter V. Miller.

Trico Products To Build

Trico Products Corp., Buffalo, will erect a research and engineering building at a cost of $250,000. It will be located across the street from the firm's main plant.

Delta Opens Regional Office

Delta Power Tool Division, Rockwell Mfg. Co., Pittsburgh, opened a central regional headquarters office at 122 S. Michigan Ave., Chicago. George Madeska is the regional manager.

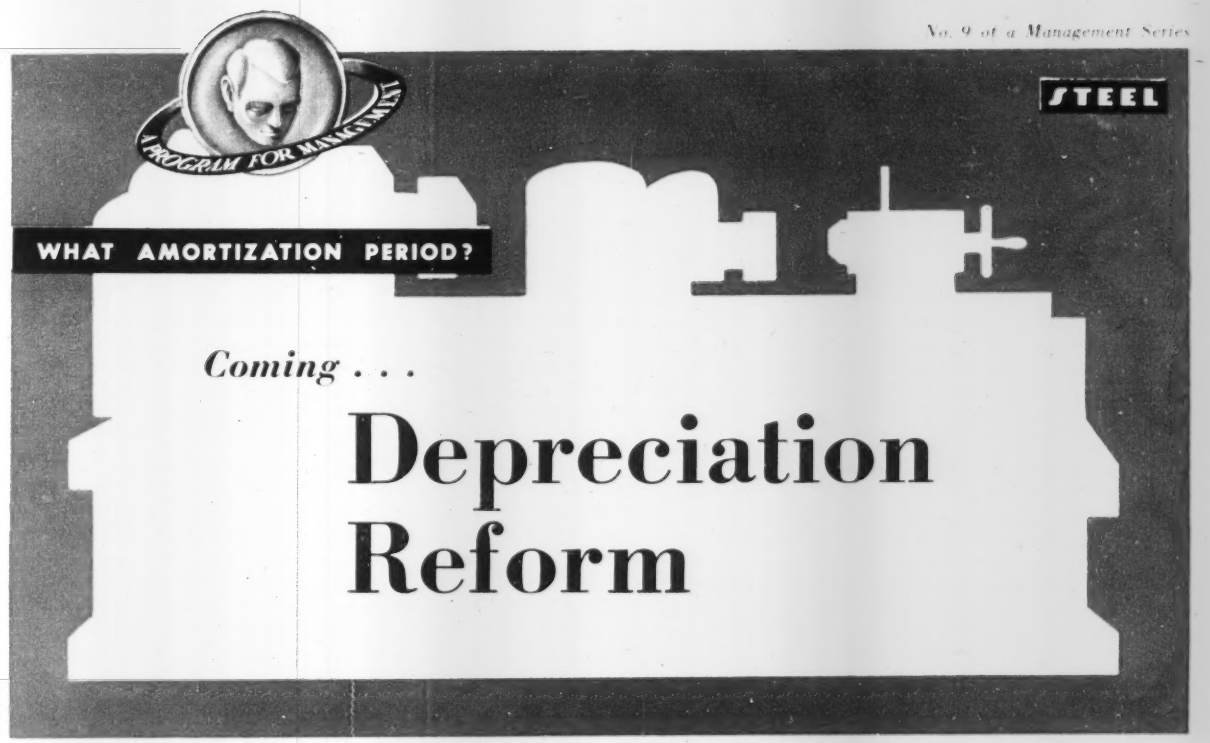
Basco Mfg. Names Agents

Basco Mfg. Co., Stamford, Conn., manufacturer of sheet steel separators appointed the following manufacturers' agents: James McLoughlin, Utica, N. Y.; H. Cluve Morrison, Milwaukee; G. S. Patton & Associates, Charlotte, N. C.; A. G. Cardineau & Co., Englewood, N. J.; Wm. McSherry & Co., Chagrin Falls, O.; K. Lester Wilson Co., Baltimore. Basco also appointed the following distributors to handle the marketing of magnetic separators: R. E. Condit Co., Dayton, O.; Brown-Darnell Co., Detroit; Smith & Klebes Inc., New Britain, Conn.; Brinnel Co., Simsbury, Conn.; Stanley Handling Equipment Co., Springfield, Mass.; Ramsdell Supply Co., Ace Machinery Co., and Georger F. Blake Inc., Worcester, Mass.; Industrial Maintenance Corp., Memphis, Tenn.; Factory Supplies Co., Rockford, Ill.; R. D. Grier & Sons Co., Salisbury, Md.; Cohn Bros. Inc., Waterloo, O.; and Cardinal Steel Co., Cleveland.

No. 9 STEEL's Management Series . . .

The editors of STEEL herewith present the ninth in a series of ten articles in this publication's Program for Management. The complete list:

1. **Public and Community Relations** (Feb. 23, page 53)
2. **Industry-Government Relations** (Mar. 30, page 53)
3. **Research, Basic and Product** (Apr. 27, page 55)
4. **Purchasing** (May 25, page 105)
5. **Business Forecasting, Midyear Review** (June 29, page 47)
6. **Distribution — Post-Emergency Challenge** (Aug. 3, page 57)
7. **Labor and Industry Relations** (Sept. 7, page 101)
8. **New Materials** (Oct. 12, page 129)
9. **Depreciation and Re-Equipment**
10. **Market Research**



Coming . . .

Depreciation Reform

A DIGNIFIED DOWAGER in financial straits was relieved to learn that she could keep up her way of life as the result of an opportune legacy from her brother.

When she discovered that a large portion of her new income would be coming from ownership of a brothel, she determined to turn down the legacy. But when more bills came in by the next mail, she decided to be realistic and keep the house of ill repute for just one year.

Dilemma—The present administration in Washington has a legacy as disturbing as the dowager's. Tax depreciation laws and administrative procedures evolved over the past 20 years bring in a lot of badly needed revenue now, and the temptation to keep them for just one more year is great even though top government officials have gone on record as agreeing with industrialists that the laws and procedures are injurious to the economy, detrimental to national defense and conducive to socialism.

Under Secretary of Treasury Marion Folsom says: "A liberalization of the present rules governing depreciation so as to allow management greater discretion would increase total investment, stimulate a generally higher level of national income and economic activity, remove sources of irritation and fruitless controversy in the administration of the tax laws and ease the financial problems of many small businesses."

Bear by Tail—The U. S. is hesitant about reform because it has a bear by the tail and doesn't know how to let go. "The problem results because the current tax depreciation laws and rules are forcing industry to underdepreciate to the tune of about $6-billion a year, according to estimates by Machinery & Allied Products Institute. That sum is being called "profit" by industry and taxes are being paid on it at the rate of at least 52 per cent probably more because of the excess profits levy.

While government and industry men agree that reform would eventually probably increase revenue, they also agree that a liberalization—no matter how it's worked—would mean a marked decrease in tax receipts in the early years, even though the decrease would be made up by increased revenues later. The problem is how to weather those early years.

A survey by STEEL shows that 78.9 per cent of 2104 companies replying want to write off their capital equipment at their own pace; 1.8 per cent do not; and 19.3 per cent express no preference. The accompanying chart indicates that if industry could write off at its own option, 87.4 per cent of the 2104 companies would write off their equipment for tax purposes in 12 years or less. Under existing regulations, the average on capital equipment is 20.74 years. For a sample of how industry feels about a 20-year write-off, see the typical comments on page 81, garnered from the returned questionnaires.

Cause and Effect

Tax depreciation matters started to get out of joint in 1931. In that year, the Internal Revenue Service (then called the Bureau of Internal Revenue) worked up a

schedule of useful lives for a list of physical assets. That list, designated Bulletin F, purported to be a scientific study of the length of time industry was actually using its equipment.

The list probably gave an accurate picture of how long industry was using equipment, but it was and is a mile off on how long industry should use equipment. World War I forced industry to keep equipment longer than usual; and the 1920s was not a period of great technological change in capital equipment, particularly machine tools. Then the depression of the 1930s forced industry to keep equipment even longer. For example, when Bulletin F was revised in 1942, it gave the useful life of a turret lathe as 25 years, compared to 16 years in 1931.

The First Blow — Bulletin F didn't create a great stir in 1931 because the easy-going practice of the 1920s when industry could write off its assets at pretty much its own option was still in vogue. But in 1934 a change came, which when coupled with Bulletin F brought about a complete reversal of the old laissez-faire depreciation of the 1920s.

At that time, the Roosevelt administration needed money. Somebody came across Bulletin F, investigated and found that average depreciation rates claimed by industry were about 10 years on equipment, somewhat longer on land and buildings, despite the fact that Bulletin F showed actual practice was to use equipment for 20 years. At first the Roosevelt administration put before Congress a proposal to effect by statute a flat 25 per cent reduction for three years in depreciation rates then being allowed. As an alternative, the secretary of the treasury offered to bring about a comparable reduction by administrative means. His offer was accepted.

The Second Blow — The result was announcement of a new treasury policy (in Treasury Decision 4422). That required taxpayers to review their property accounts, to estimate the remaining useful lives of the assets and to revise their depreciation rates so as to write off undepreciated balances over those estimated remaining lives.

How Industry Wants To Write Off Its Assets

Under 3 years	1.5%
3-7 years	26.0%
8-12 years	59.9%
13-17 years	8.3%
18 years and over	4.3%

T. D. 4422 also reversed the burden of proof, placing on the taxpayer the responsibility of justifying whatever rates of depreciation were claimed. Formerly the burden of proof had been on the government, and few claims had been disallowed except those that were obviously extravagant. As T. D. 4422 worked out, few companies could justify their rates of depreciation if they were lower than Bulletin F. So, Bulletin F became the gospel and the Bureau of Internal Revenue the prophet of that gospel.

The Damage—What started out as a mere three-year expedient to increase tax receipts has turned into what amounts to a permanent reversal in the government's whole philosophy on amortization.

As a result of nearly 20 years of government activity, the overall weighted average of the rates allowed on the depreciable fixed assets of American corporations is now between 4 and 5 per cent per year, exclusive of assets subject to special amortization.

Other Results — In addition to spreading the write-off over full estimated service lives, points out MAPI, the bureau has tightened up on other aspects of depreciation accounting. Here the most important change has been an insistence on "group" accounting wherever feasible, with a consequent denial of current deductibility for losses on partially depreciated retirements. That has aggravated the effect of reducing the depreciation rates themselves.

In group accounting all items in the account (necessarily a group) are depreciated at the average-life rate as long as they survive, regardless of whether their individual lives are shorter or longer than the average. No disposal losses are taken on premature (subaverage) retirements, the theory being that the underdepreciation of the short-lived assets is compensated for by the overdepreciation of the long-lived. The method is distinguished from item accounting, which discontinues depreciation on all items reaching the average life, and writes off currently as a terminal loss the undepreciated balance on all items retired before that point is reached.

Complication—Then, to complicate matters still more, along comes inflation. Since bureau policy is to permit depreciation on the basis of replacement cost, industry has had to absorb the impact of the declining value of the dollar.

To see how the combined effect of government policies and inflation hit you, examine the hypothetical case on page 82, as worked out by L. D. McDonald, executive vice president of Warner & Swasey Co., Cleveland.

The Cost — That case study shows the direct cost to you. What are the direct and indirect costs to the nation of current depreciation policies?

MAPI, which has probably done more study on this subject than any nongovernment organization in the country, estimates that because of the lags in the depreciation system used since 1934 the cumulative total of such underaccruals, even on assets now in existence, is around $50 billion in 1953 dollars. If the present system is continued, those lags will go on. Currently, they're mounting up at a rate of $6 billion a year.

Erosion — What we have here are paper profits, much of which are taxed by the government and claimed as dividends by shareholders. Paper profits are also ammunition for unions to win higher wages for workers. Industry has been suffering an erosion of its capital for 20 years.

That capital erosion is the reason why America today has a mediocre physical plant, decidedly inferior, say observers, to that of Sweden or Switzerland where lib-

eral depreciation policies prevail. The U. S. has been able to keep up production, not because of a superior plant, but because of a good and generally plentiful workforce, a resourceful job by management and extensive use of inefficient overtime and second or third shifts.

Step Toward Socialism—Industry's capital erosion has also permitted government to put its foot in the door. During World War II and the Korean war many plants didn't have the money to buy the equipment for war work. Using tax money, the government did. As a result, the U. S. today owns 20 to 25 per cent of the nation's productive capacity.

That control by one source of one-fourth our ability to produce is one of the most important reasons why socialism is still a big threat to this country today. It came about almost entirely because of the change in depreciation rules started back in the early 1930s.

Other Drawbacks—The preceding paragraphs have summarized some of the most calamitous results of our depreciation system. Here are some more, although less serious, drawbacks:

1. Depreciation requirements put into practice in 1931 have increased the Internal Revenue Service's work enormously to say nothing of industry's. Because of this and other factors, the U. S. is five years or more behind in audits of many companies' records.

2. The government's depreciation philosophy perpetuates an erroneous re-equipment policy by industry of the 1920s, 1930s and 1940s that was probably wrong then and certainly doesn't meet today's conditions. Even to dignify industry's method of replacing equipment by calling it a policy is misleading. There has been no system for 30 years. For example, 76.9 per cent of 2104 companies replying to a STEEL questionnaire have no planned replacement program for obsolete and uneconomical equipment. Only 8.7 per cent have ever used the MAPI formula, probably the most scientific approach yet devised to keep your capital equipment up to date. Government policies tend to perpetuate this lack of system. Bulletin F as revised in 1942 still stands, yet look at the technological advance in the last 11 years. Bulletin F forces an amortization pattern on industry that is psychologically unsound. You tend to keep a machine the 20 years allowed by F, just to get your full depreciation out of it.

3. Most of you must depreciate on a straight-line basis that is, the same depreciation must be charged off when the machine is one year old as when it is 19 years old. That is despite the widely recognized fact that machines depreciate more in their early years than later. Other accounting methods are permitted that partly remedy the fault but they're allowed only to a limited extent.

4. U. S. policies permit only limited relief in relaxed depreciation provisions for extraordinary obsolescence—technological change that obsoletes equipment before it is physically worn out. As the rules stand now, you have to predict in advance how you'll be hit by extraordinary obsolescence. Organizations such as railroads have been able to do it in predicting their switch from steam to diesel locomotives. But how often can that be done with accuracy?

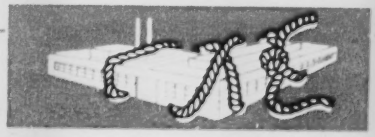
What Can Be Done?

America isn't the only nation in the world with depreciation problems. Many other countries have or had difficulties. But the difference is that most of them have already reformed. Even undeveloped Pakistan has more liberal depreciation laws than we do.

Sweden — Sweden has the most liberal laws in the world. From 1938 until Jan. 1, 1952, corporations were permitted to depreciate capital equipment without any limit, and it was quite common to write off 100 per cent in one year in many cases.

Although for 1952 and 1953 annual maximum depreciation allowances have been limited to 20 per cent of cost to conserve the nation's foreign exchange, Sweden is expected to return shortly to unlimited depreciation allowances. "As a result of its realistic approach to depreciation in the past," says Warner & Swasey's Mr. McDonald, who is also chairman of

How Industry Feels About Depreciation



"A small company has difficulty, because of the tax burden, to put aside funds for machinery replacement."

"We're holding up some of our purchases of equipment until we learn what the new depreciation laws will be."

"Amortization should be on a sliding scale which would reflect resale prices."

"Washington has promised depreciation reform. Let's see if the Republicans keep their word."

"Accelerated depreciation would enable us to increase our machine purchases."

"An educational job is needed to show management why it should replace old machines more frequently."

How Inflation Hits You From Behind

You have a machine tool you paid $10,000 for ten years ago. Under Bulletin F the device has a 20-year life. You have therefore recovered, through depreciation allowances, $5,000 of the capital which you invested originally in the machine. But you want to replace the tool because it has had heavy duty, it has started to wear out, and furthermore, it is obsolete—a new and better model is available.

The new model costs $18,000. The difference in prices is due in part to inflation and in part to the fact that the new model is greatly improved with features not possessed by the old one.

Let's assume that you have in hand the $5,000 recovered in depreciation allowances on the old machine. The new tool will take $13,000 more. But that $13,000 will have to come out of earnings after taxes.

With a federal income tax rate of 52 per cent, you will have to earn, before taxes, $27,083 in order to supply the $13,000 of earnings after taxes needed to complete the purchase of the machine. Add to that the $5,000 recovered in depreciation allowances on the old machine, and you have a total of $32,083 involved.

And how much of that total can you recover in depreciation allowances? Just $13,000—the actual cost of the new machine. And how fast? At the rate of $900 a year, spread over 20 years.

the Tax Policy Subcommittee of the National Machine Tool Builders' Association. "Sweden has some of the finest and most modern factories in the world."

Switzerland — For federal tax purposes, Switzerland grants an option between an annual depreciation allowance of 25 per cent of undepreciated cost or an allowance on the straight-line method. The straight-line rate is one-half or two-thirds of the declining balance rate. For purposes of cantonal taxes, the depreciation allowances are substantially higher than those for federal tax purposes. That nation's factories are also among the most modern in the world.

Great Britain—In Great Britain, says Mr. McDonald, taxpayers are allowed to choose between a reducing balance or a straight-line method of depreciation. Basic rates are established for property categories, and a percentage of the basic rate may be applied on the reducing balance method to the undepreciated cost of the property.

In addition to that, from 1946 until 1949 taxpayers were granted an initial allowance of 20 per cent of the cost of machinery and plant equipment for the first year. That was increased to 40 per cent from 1949 to 1951. Initial allowances were suspended by the Finance Act of 1951, but in a statement on Apr. 14, 1953, the chancellor of the exchequer proposed the reinstatement of the initial allowance at a 20 per cent rate for plants and machinery. Such an allowance is substantially in excess of depreciation allowances allowed in the U. S.

Canada—In Canada, until the Income Tax Act of 1948, depreciation was allowed on the straight-line method, but the revenue authorities were given discretion to permit a doubling of the allowances otherwise determined. Under the Income Tax Act of 1948 and regulations, a diminishing balance method was adopted, and a maximum rate for industrial machinery and equipment was set at 20 per cent. Adjustment was permitted so that a taxpayer could get an allowance not less than that which would have been permitted under the doubling-up procedure of the previous act.

In addition, in 1951, accelerated depreciation was permitted on facilities certified as essential to the defense effort, facilities not otherwise available and facilities whose usefulness for other than defense work was limited.

In general, Canada now permits a liberal diminishing balance method of depreciation coupled with a provision for accelerated depreciation.

And the U. S.?—So, what can be done about depreciation reform in the U. S.? Action must come about in these four areas: Administrative reform by the Internal Revenue Service, legislative reform of federal laws by Congress, reform of some state laws by state legislatures and reform of some bad industry practices.

Administrative Change — Not much can probably be accomplished by administrative reforms in IRS. Present policies as developed by previous administrations have been going on too long. Last May the commissioner of internal revenue issued instructions in Revenue Rule 90 which should have the effect

of reducing depreciation controversies between the taxpayers and revenue agents. Rule 90 provides that "it shall be the policy of the service generally not to disturb depreciation deductions, and revenue employees shall propose adjustments in the depreciation deduction only where there is a clear and convincing basis for a change."

Probably not much more can be done by IRS. It admits that Bulletin F needs revision but sees no point in doing that job until Congress makes up its mind about reforms in the laws. Present top officials, in sharp contrast to the personnel in charge under Democratic administrations, want legislative reform. Although the nation's depreciation rules have undergone dramatic changes in the past three decades, those shifts have come about almost entirely through administrative actions. Actual depreciation laws on the statute books have not been changed fundamentally since 1918.

Legislative Change — The most recent legislative change affecting depreciation is Public Law 539. It provides that in loss years you may carry forward tax benefits to a reserve and apply them to income account in subsequent years. Although it's a rather cumbersome device, it permits you to save your depreciation credits when you have a loss year and apply them against income when you have a profitable year.

But that's really a minor improvement. What's needed is fundamental legislative reform. There have been dozens of proposals for thorough reform, but all are variations of these five basic ideas:

1. Extend the present five-year amortization to everybody and make it permanent. Sen. Homer Capehart (Rep., Ind.) is the champion of this idea in Congress and had a bill on the subject in the last Congress which got nowhere. Five-year amortization as used during World War II and the Korean war has been fairly successful. MAPI says it "provides the most effective means for getting a defense facilities program executed promptly and at minimum cost to the taxpayer."

But MAPI also points out that the program is an expedient for emergency periods. As the table on page 80 indicates, the majority of industry probably wouldn't want to write off their equipment in five years. The median period of time is about ten years.

What's more, five-year amortization for all would probably be too tough on government tax receipts in the early years to have any chance of approval by the Treasury department. Already the device is dying a slow death. Only six months ago Office of Defense Mobilization was approving certificates of necessity at a rate of more than 100 per week. In October the rate was about 10 per week. Thus far in the Korea-inspired amortization program, more than 27,000 applications for fast write-offs have been received. As of Oct. 1, more than 18,000 had been approved for a total facility investment in excess of $29 billion (see the chart above).

2. A second method, championed by the National Machine Tool Builders' Association and others, would permit optional depreciation. Under that method, NMTBA proposes that it be applied initially to durable, "productive" equipment. Eventually, by an orderly transition, it might be extended to all depreciable property. To cushion the shock of transition on federal tax receipts, the association also proposes to permit only a 50 per cent write-off the first year.

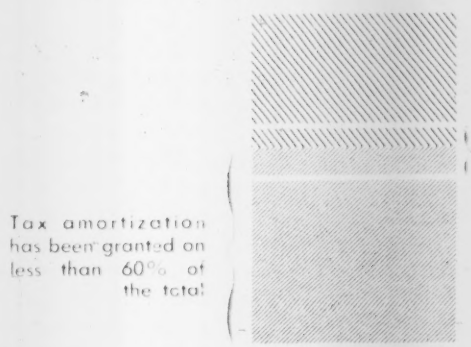
Proponents of the idea argue that it would cut down on government and industry paperwork to have optional depreciation, reduce the time now lost in haggling over allowances, make unnecessary any special amortization in times of emergency and ultimately increase federal revenues because it would provide an impetus to continued prosperity. Proponents also believe that the average length of time chosen by industry to write off assets will be conservative, a belief supported by STEEL's findings, as recorded on page 80.

People in favor of the idea also say that optional depreciation would return to management one of management's functions usurped by the reversal in depreciation policies during the early 1930s.

3. A third proposal for reform is the accelerated straight-line method. Under this device, championed for a time by MAPI but now dropped in favor of another technique, equipment would be written off as it is now at the same rate each year. But under the accelerated plan, the yearly write-off would simply be increased. The most common suggestion is to change the present 20-year average write-off to at least 14 years. Thus, the annual percentage rate would be jumped from 5 to at least 7.

That proposal is substantially what was actually practiced before 1951. Then, industry wrote off its assets for tax purposes on an av-

Industrial Expansion Stimulated by Rapid Tax Amortization


$29 billion
Total investment
$4.2 billion investment in new facilities has been approved January-September, 1953
Tax amortization has been granted on less than 60% of the total

Despite Depreciation Policies . . .

New Plant and Equipment Expenditures Are High		
	1953	$27.8 billion
	1952	26.5 billion
	1951	26.3 billion
	1950	20.6 billion
	1949	19.3 billion
	1948	22.1 billion

erage of 10 to 11 years. The method is not very scientific and doesn't conform to reality in that the write-off would be the same in the first year as in the last of the amortization. Actually, depreciation is the most rapid in early years of an asset's life.

4. A fourth proposal is to allow an early write-off of a substantial portion of the asset's cost, then depreciate the rest of it by the ordinary straight-line method. In effect, that's the way five-year amortization is working out now. Certificates currently permit, on the average, 60 per cent of expansions' cost to be written off in five years, the rest to be amortized by conventional straight-line rates. The device has this to recommend it: It has helped stimulate expansion to the tune of $26 billion a year or more since its inception at the start of the Korean war. This year new plant and equipment expenditures promise to hit a record $27.8 billion (see the chart above).

5. The fifth method for legislative reform is declining-balance depreciation. Although widely used in Great Britain and in British Commonwealth countries, it has had thus far limited currency in the U. S. In part that is due to American accounting tradition, in part to restrictions imposed by the Bureau of Internal Revenue on its use for tax purposes. The bureau has consistently refused to allow a declining-balance rate of more than 1.5 times the corresponding straight-line rate. Thus, the practice to date has been to allow, on the average, only a 7.5 per cent rate by declining-balance on an asset that would get a 5 per cent rate in straight-line. So, 7.5 per cent of the original cost of an asset being depreciated by declining-balance would be written off the first year, 7.5 per cent of the remainder in the second, and so on. Under that method, no asset is ever completely written off, but since nearly everything has some salvage value, that situation is not a serious drawback.

The real drawback is the bureau limitation to keep the rate 1.5 times the corresponding straight-line rate. That makes declining-balance an unattractive alternative to straight-line, except for taxpayers expecting to dispose of their assets in the early years of life.

To make it attractive, argues MAPI, which is now championing the method, it must be used at approximately twice the straight-line rate. Used that way, it gets rid of roughly two-thirds of cost in the first half of the asset life, and so conforms to the way assets actually wear out or obsolesce. Moreover, the write-off declines continuously, as it should, in each successive year of application.

Double-rate declining-balance depreciation has a good time pattern and about the right degree of acceleration. It is simple to apply and highly flexible accountingwise. It's the only system allowed for tax purposes in Canada, where straight-line write-off was once the tradition.

The preceding five basic methods for reform would all minimize the effect of any future inflation because they would permit fast write-offs before extensive inflation would be likely to take place. But none of the techniques would offer any redress for past inflation.

The best way to accomplish that is adjustment of existing assets' value by a series of official multipliers, each applicable to the net survivals from the acquisitions of a particular prior year or group of years. Those multipliers, says MAPI, would reflect approximately the number of current dollars required to equal a dollar of the acquisition period.

To see how this can be done, take a look at the accompanying hypothetical case worked out by MAPI. The company has, say, $1-million of original-cost book value broken down as indicated. The application of the official multipliers writes up the next account of the company from $1 million to $1,350,000 or 35 per cent. That adjustment necessarily entails a break in the continuity of the previous property accounts, but unless inflation continues, bringing other similar adjustments in the future, the accounts, once restated, can be carried forward without further discontinuity, and in routine fashion.

State Change — But reform of federal laws is not enough. Many state regulations are a problem, too. Those vary as widely as the climate in the country. Ohio, for example, has Rule 279. That imposes upon taxpayers, whose depreciation exceeds 60 per cent of the cost of the asset, rates of depreciation which have little relationship to those prescribed by Bulletin F. So for companies in Ohio separate clerical work is necessary.

Corporations doing business in New Jersey have been faced with a similar problem in connection with assets subject to five-year amortization. That state requests such taxpayers to determine the actual values of such assets as of the close of the year upon which the return is made. No taxpayer is likely to overvalue those assets, but what basis can be used that will not be a controversial one? In several instances the state has taken exception to the values set by taxpayers and has requested additional data or has made arbitrary valuation of its own.

Needed is at least a modicum of conformity with federal regulations.

Industry Change — But to get complete depreciation reform, industry must pitch in, too. Here's how:

1. Make a review of your buildings and equipment. Find whether

the period of life assigned to the item is in accord with Bulletin F, and if not, whether the life assigned can be supported by factual data. The rules permit depreciation "allowed or allowable." Failure to claim that which is allowable may result in loss of depreciation deductions; the claiming of excessive depreciation may result in audit adjustment and expensive tax assessments.

2. Watch market trends, competitive changes and technological advances so that claims for unusual obsolescence may be made in the proper year.

3. Start a continuing re-equipment program based on scientific evaluation of where and when you need new equipment. If practiced widely enough and long enough, a good replacement policy based entirely on scientific, not tax, considerations would force a downward revision in Bulletin F's schedule of useful lives. Theoretically, scientific replacement programs, coupled with periodic revisions in Bulletin F, could substantially accomplish the depreciation reform so necessary.

Yet, reform via that route is impossible from a practical consideration. Relatively few of the 2101 companies replying to STEEL's questionnaire have used or expect to use the MAPI formula for equipment replacement. That plan is generally conceded to be the best approach to the matter. It takes into account all factors involved in re-equipping. Derivation of the formula may be found in *Business Equipment Policy* by George Terborgh, for sale by MAPI, 120 S. LaSalle St., Chicago 3, Ill. A companion volume valuable in setting up and administering a re-equipment policy is MAPI *Replacement Manual*. A National Center of Education & Research in Dynamic Equipment Policy has been established at Illinois Institute of Technology in Chicago. With MAPI backing, it plans to teach equipment replacement to executives and to carry out further studies in the field.

The Chance for Reform

Of the four major areas where depreciation reform is needed, the most important is in legislative action by Congress. What's the outlook there? Fairly good. Rep. Noah M. Mason (Rep., Ill.), influential member of the Ways & Means Committee which must originate any tax laws, told STEEL: "We should liberalize the depreciation item in our tax system to encourage investment of capital, with speediest amortization in the first three or four years." He says the majority on the committee and the policy making officials in the Treasury department also believe as he does.

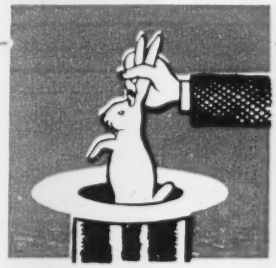
Right now our entire tax system is being studied through joint efforts by the staffs of the Ways & Means Committee and the Treasury department. The depreciation item is high on the list for reform, a top Washington official told STEEL.

Timetable—The final decision on what that reform will be probably won't be reached until late December and won't be made public until the omnibus tax bill goes into the hopper when Congress convenes in January. The whole tax bill may be the subject for furious debate in Congress, but the depreciation item will be left just about as written.

The Treasury and Ways & Means depreciation experts have not yet made up their minds completely about what they want, but generally you can expect the depreciation item in the omnibus tax bill to carry these provisions:

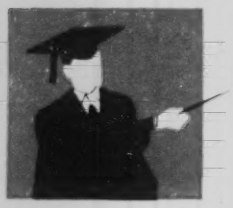
Permission to use one of two different methods to get fastest write-off in earlier years—probably either the double-rate declining-balance or the straight-line-with-big-initial-write-off method.

Direction to the Internal Revenue



It's Possible: You Can Adjust for Inflation

Year	Remaining Book Value of Assets Acquired in Year (Thousands)	Assumed Official Multiplier for Year	Adjusted Book Value (Thousands)
1953	$ 122	1.00	$ 122
1952	101	1.01	102
1951	77	1.04	80
1950	126	1.13	142
1949	62	1.18	73
1948	73	1.21	88
1947	107	1.32	141
1946	44	1.54	68
1945	26	1.51	39
1944	25	1.73	43
1943	28	1.71	48
1942	43	1.79	77
1941	48	1.85	89
1940	33	1.95	64
1939	29	2.01	58
1938	11	1.96	22
1937	17	2.02	34
1936	18	2.17	39
1935	10	2.22	22
Total	$1,000		$1,350



How's Your I.Q. on Depreciation?

Indicate whether the following questions are true or false. Score all correct answers 5 points. A grade of 80 or better indicates a high depreciation I. Q. Turn this page upside down to learn the correct answers.

1. Current tax depreciation practices force industry to underdepreciate at the rate of $6 million a year. T F
2. The government hesitates to reform because of the large initial tax loss. T F
3. A STEEL survey shows that most of industry wants to depreciate at its own pace. T F
4. Tax depreciation matters started to get out of joint in 1921. T F
5. Most of the reversal in U. S. depreciation policy has come about through administrative fiat rather than changes in the federal statutes. T F
6. Rates allowed on depreciable fixed assets now average between 11 and 15 per cent. T F
7. America today has the best productive plant in the world. T F
8. The U. S. today owns 20 to 25 per cent of the nation's productive capacity. T F
9. Most companies today are required to depreciate on a straight-line basis. T F
10. Sweden has the most liberal depreciation laws in the world. T F
11. A great deal can be expected in administrative reform of U. S. depreciation policies. T F
12. There are five basic proposals for legislative reform. T F
13. All the proposals would give substantial redress for past inflation. T F
14. Industry can't do much to bring about depreciation reform. T F
15. Chances are fairly good for reform of depreciation rules by congressional action. T F
16. The new law will probably apply to new assets only. T F
17. The new law will probably permit industry to depreciate more rapidly in the early years of the asset's life. T F
18. Canada outlaws the diminishing-balance method of accounting. T F
19. Bulletin F is no longer much of a factor in current depreciation policies. T F
20. Treasury department officials agree that depreciation reform is vital. T F

Answer Key to True-false Questions:

1 F, 2 T, 3 T, 4 F, 5 T, 6 F, 7 T, 8 F, 9 T, 10 T, 11 F, 12 T, 13 F, 14 F, 15 T, 16 F, 17 T, 18 F, 19 F, 20 T

Service that it revise Bulletin F, which will be kept as the standard of useful lives.

Direction that the new law will be effective only on equipment bought on or after some specified date.

Direction that original, not replacement, cost will continue as the basis for depreciation.

Disappointment? — Those provisions are not as liberal as industry wants. That's because of those disturbing problems that also faced the dowager in her decision about the house of ill repute. The government can't afford to lose the revenue that an across-the-board reform would mean — hence the provision that the new regulations apply only to new equipment purchased after a specified date. Nor will there be any provision to solve industry's problems caused by past inflation. "We wish we could," says one government expert, "but it would be too expensive and too complicated."

The reform from the government standpoint will not mean too great a revenue loss, will be a shot in the arm to the economy at a time next year when business may be declining and will be at least a partial answer to industry's bitter complaints.

A Help—The reform from industry's standpoint will help, undoubtedly. Eventually all assets will come under the reformed method of depreciation. It has already absorbed its losses from inflation and never seriously expected redress. The new faster write-offs will enable it to minimize the effects of inflation in the future.

The reform will work hardships on those companies that had the misfortune to buy equipment just before the specified date. However, much of that equipment probably will be covered by 5-year amortization. That special amortization, incidentally, will probably be killed off on the day the reform goes into effect.

When — and if — Congress passes the depreciation reform, industry will have won only a partial victory in its long fight to get snail-like regulations in pace with a greyhound age. Yet it will be a good victory because time will eventually make the success complete.

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Now available..COPPERPLY

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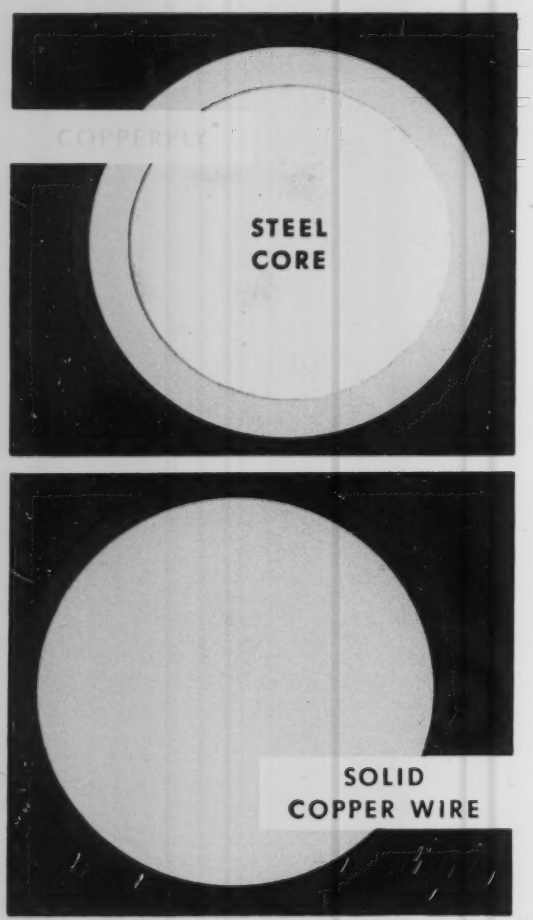

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Wagner Litho Machinery, Jersey City, N. J.
Metal Decorating Equipment

Worcester Wire Works, Worcester, Mass.
Round and Shaped Steel Wire, Small Sizes

STEEL
November 2, 1953

Technical Outlook

FREE-MACHINED TOOLS— Lots of producers have gained experience with free-machining steels in molds and die casting dies where tensile and impact properties are important. Vanadium Alloy Steel Corp. has come up with a new free-machining metal that exhibits the kind of edge strength needed in cutting tools. First applications probably will be in the field of unground form cutters and hobs. Alloy, so new it hasn't been named, is an extension of the company's Speed-cut line originated in 1946.

DIAMONDS AND TITANIUM—Chief engineer of one of the carbide tool manufacturers is of the opinion that carbides might *not* be the best tools to use when machining titanium. Experimental work indicates that it might take something harder than carbide, probably diamonds, to effectively cut the metal.

NEW ALLOY— Combining high strength and high conductivity, Beryldur, product of Beryllium Corp., Reading, Pa., is being hailed as the answer to the need of metal industries for a copper base material of low beryllium content. It and a flake form of metallic beryllium of 99.5 per cent minimum purity were shown by the firm at the 35th National Metal Exposition at Cleveland. Latter product is said to be especially suited for fabricating operations, such as hot pressing, because of its ductility.

QUICK HEATLESS DRYING— Decorative coatings of paint, varnish and ink can be rapidly dried without use of heat, thanks to a new process developed by Meyercord Co., Chicago. Called Chem-Dry, the process dries coatings which are based on alkyd resins, epon estors, urea-formaldehyde, melamine-formaldehyde, rubber and similar materials. Coated parts are conveyed through sulfur dichloride vapor chamber where thin coats are dried in a few seconds. Thick films acquire surface dryness and hardening progresses even after parts are removed from vapor chamber. Processes involving several coatings can be made continuous.

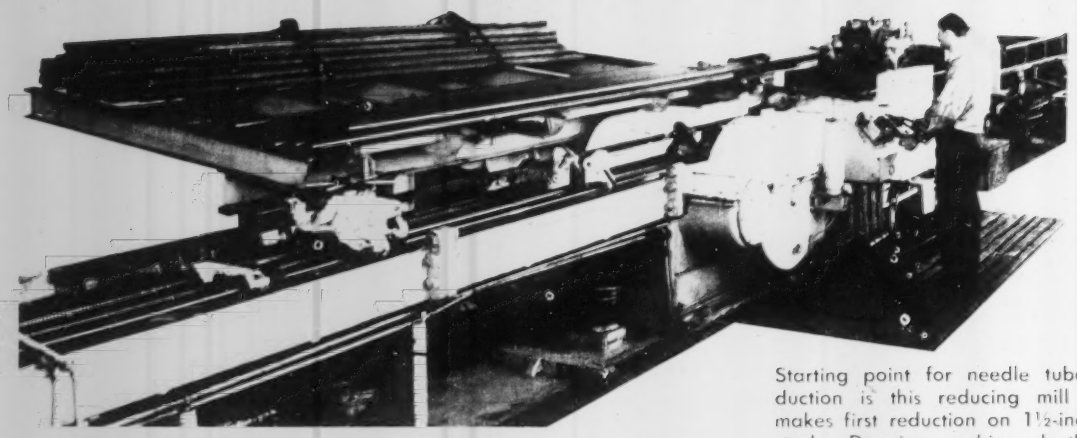
LOOKS AROUND CORNERS— Inspectors can look around right-angle corners, obliques and other blind spots in parts and machines with the Borescope, according to American Cystoscope Makers Inc., New York. Available in several lengths, the device supplies its own illumination.

MAN-MADE VOLCANO— New arc-torch is said to be capable of burning a hole in solid granite with its 8000°F heat. According to Eutectic Welding Alloys Corp., Flushing, N. Y., its DynaTrode creates its own arc and will attack non-conductive material without a ground connection. Arc will burn in mid-air. Equipment needed: Conventional welding machine and specially-coated arc rods.

DEEP FREEZE HARDENING— Highlights of their experimentation in cold treating of metals lead Bowser Technical Refrigeration researchers to believe that existing methods might well be due for some changes. Here's why: "Quick-frozen" tool steel can be given optimum hardness in three minutes at sub-zero temperatures . . . Stabilization of precision gage blocks is achieved in one-tenth the time usually required . . . Cold treating increases ductility of powdered metal parts.

NEW FORM— Zirconium tubes are being produced experimentally on a hot extrusion press designed for steel and high-alloy tubes at Allegheny Ludlum Corp., Pittsburgh. Work to date appears to be practical, and officials believe any product normally produced on steel mill equipment can be duplicated in zirconium.

Metalworking Outlook—p. 31 Market Outlook—p. 139



Starting point for needle tube production is this reducing mill which makes first reduction on 1½-inch OD stock. Drawing machines do the rest

Needle Tube PRODUCTION

It isn't merely a matter of drawing little ones out of big ones. Nature of the finished product and its uses demands sharp tolerances and some tricky heat treating

MANUFACTURE of needle tubing would seem to be a simple metallurgical production task. Just start with a much larger diameter tubing as original stock and draw it down to size, and pickle or wash it to provide the required clean inside and outside surfaces.

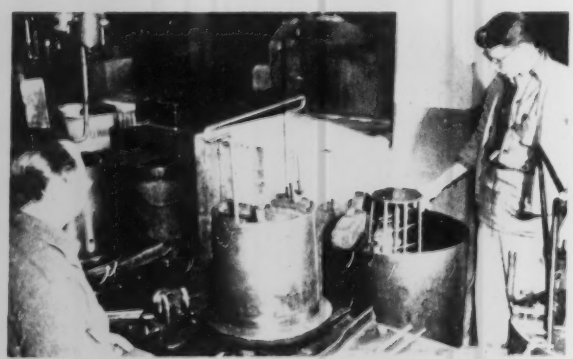
But the company that pioneered in this production, Superior Tube, Norristown, Pa., learned from experience that the process isn't simple at all.

They draw millions of feet of specialty tubing every month, in 55 analyses including carbon, alloy and stainless steels, nickel alloys, beryllium copper and titanium. Sizes range from 0.008 to 0.625-inch OD, with certain analyses being produced in sizes up to 2.0625-inches OD in very light walls.

Here's How — Complexity of operations at the Superior mill is well illustrated by the production procedure for 20-gage commercial-quality hypodermic needle tubing. No less than 87 separate operations are required to draw the tubing down from 1.50 inches OD to 0.035 inch OD, to inspect the tubing during various stages in production, and ship to customer. To bring the tubing down to size, one pass on the tube reducing machine and many separate drawing operations are on the production schedule.

For simplification, production of 20-gage needle tubing at the Superior mill is separated into two major steps: (1) Reduction of raw material as received at the mill from 1.500 inches OD to 0.310-inch OD tubing, which is considered a process store size for production of needle tubing, and as such is carried in stock at the mill.

Big Reduction — For production of its Type 304 stainless needle tubing, Superior purchases austenitic chromium nickel stainless steel, received at the mill as seam-



In the last drawing operation, music wire is used for the mandrel. Superior buys commercial music wire and draws it to the exact size and uniformity required

Tubing is immersed in water while compressed air is forced through it. Bubbles quickly indicate leaks, and operator cuts away defective portions of the tubing

less tubing, 1.500 inch OD x 0.125 inch wall. After careful visual and metallurgical inspection of the tube, it is placed over a mandrel and is rocked between two dies in a tube reducing machine. Use of compressive forces in this operation permits considerably greater and more economical reduction in one pass than can be accomplished by straight tensile drawing on benches.

When it leaves the tube reducing machine, tube is degreased, pickled, and annealed. It is successively mandrel-drawn to bring it down to the process store size, and after each drawing operation it must again be degreased, pickled, annealed and pointed. Drawing operations alone have brought about a 40 per cent reduction in OD size.

Drawing & Sinking—Now begins the series of drawing operations which reduces the tubing from 0.310 inch OD to 0.035 inch OD, or better than a nine-tenths reduction in diameter. Wall, however, is reduced by only two thirds. Almost half of the drawing operations are with mandrel, and on the final drawing operation the tubing is so fine that it is drawn over music wire. So close are the tolerances at this last stage that Superior draws the music wire to obtain the exact size, hardness, finish and uniformity required for such an exacting application.

To give closest possible control on OD, the tubing is drawn to finish through the die without inside support. At the beginning of this sinking operation, tubing is quite long and, since there are no mandrels to withdraw, it has been found most convenient to coil the tubing on a drum as it is drawn through the dies.

Split Testing — After tubing is drawn to final size, it is tested for splits and for obstructed ID. Coils are hand reversed in a figure eight to bring out any internal wall fractures, then both ends are inserted in a rubber washer mounted on the head of an air line containing 100 pounds per square inch air pressure.

Coil of tubing is submerged in water so that air bubbles will reveal any splits which may be present. The inspector cuts out portions of tubing with defects, then inserts one end in the air line and the other end under water to assure that there are no obstructions inside the tubing.

Straightening and Cleaning — From split testing the coils of tubing are taken to the straighteners. These machines, specially designed by Superior, use an ingenious revolving head which straightens the tubing continuously as it is fed through.

After straightening, tubing is cut into lengths of 6 feet maximum and 2 feet minimum. It is then cleaned in a vapor degreaser and blown out. Sample pieces are tested in the laboratory for stiffness and if returned o.k., the entire lot is visually inspected.

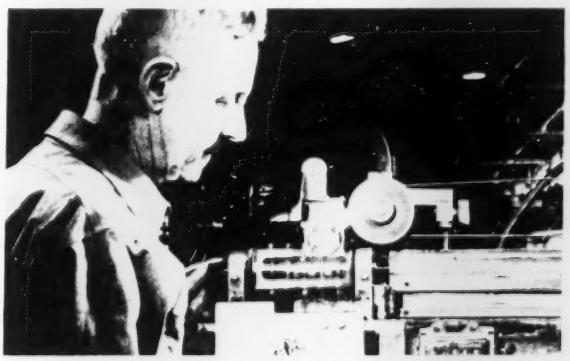
Heat Treating — As is well known, cold working austenitic stainless steel will increase its strength and hardness to a marked degree. For this reason the tubing is put through appropriate annealing operations between various drawing stages, to secure the necessary ductility for further drawing.

Extensive use of controlled atmospheres dried and purified disassociated ammonia gas, nitrogen, hydrogen, and cracked city gas protects surface of tubing and assures uniform physical properties. Superior also has facilities for vacuum annealing.

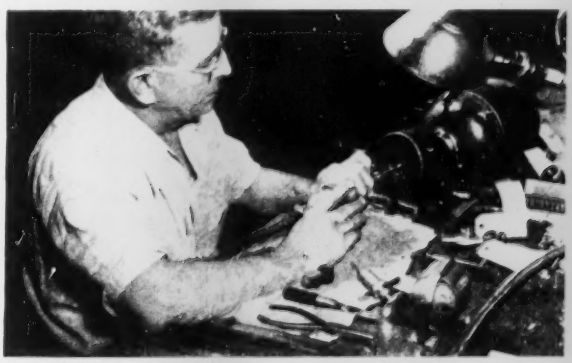
Temper Points — In Superior's production of hypodermic needle tubing, successive annealing operations are carried on between drawing stages until the temper point, (point from which desired temper of finished product is obtained) is reached. The property of strength-increase with cold working is then taken advantage of in the final drawing operations to develop maximum tensile strength and flexibility, which is so necessary in tubing for hypodermic needles.

In fact, tubing for hypodermic needles is customarily furnished in a special hard-drawn temper, or "needle temper," which is considerably harder than the standard hard drawn tubing. Needle tubing for mechanical and instrument applications can also be supplied in annealed, half-hard, and full hard tempers, depending upon fabrication and mechanical property requirements.

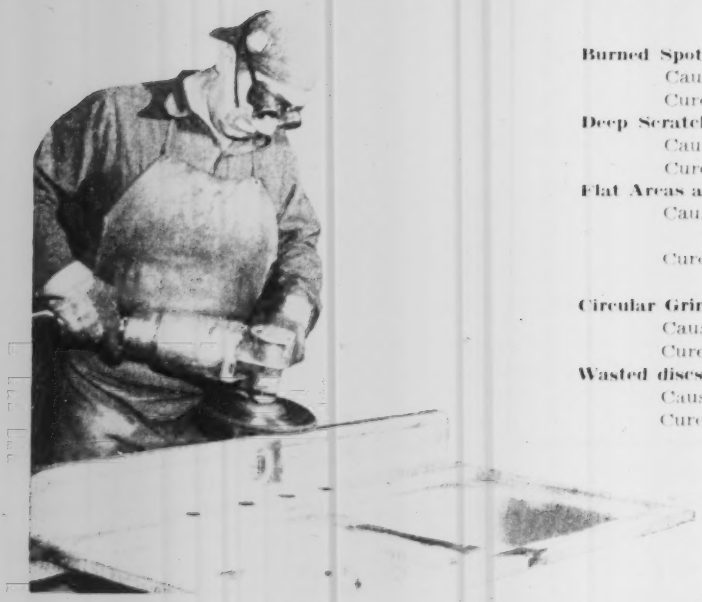
Elimination of annealing after the temper point calls for special measures to cope with the increasing hardness of the material. Thus, in the final sinking operations, the tubing has become so hard that diamond dies are used.



In special machine devised by Superior, bent tubing is fed in at left, is straightened continuously in the revolving head, center, comes out straight at right



Polishing a diamond drawing die with a lap tool is only one of the quality control measures taken. Note the hypodermic used to squirt diamond paste into the die



DISC GRINDING HEADACHES
. . . . their causes and cures

Burned Spots
Cause: Dwelling too long in one spot
Cure: Use timed strokes, lighter pressure

Deep Scratches
Cause: Filled disc, loose metal or dirt
Cure: Use proper grit, keep work clean

Flat Areas and Depressed Spots
Cause: Reversing stroke on work, following contours
Cure: Lift sander at end of stroke, use hard backing pad

Circular Grinding Marks
Cause: Coarse grit, steep grinding angle
Cure: Cross grind, maintain constant pressure

Wasted discs
Cause: Discarding clean worn discs
Cure: Cut down discs, use on curved surfaces

YOUR DISC GRINDING PROBLEMS

You can get a lot more mileage out of your abrasive discs and a better product, too, if you sidestep five of the most common disc grinding faults. Here they are

By J. KARL McLAUGHLIN
Product Engineer
Behr-Manning Corp.
Troy, N. Y.

YOU CAN turn out a better-finished product and pocket 10 to 25 per cent of your abrasive disc costs as well if you put those discs to work for you properly.

That's what a well-known refrigerator manufacturer did. The company's experience is typical: A lot of time was spent investigating finishing problems but little thought was given to techniques for prepaint and preplate preparation of the metal. So inspectors continued to reject too many refrigerators because of poor finish. Often they had to be stripped and refinished, which meant loss of profit on the next two or three cases coming off the line.

After checking over operators' grinding techniques and correcting several basic faults, the company slashed drastically the costly and time-consuming rework resulting from poor quality finishes. It found its monthly bill for abrasive discs was several hundred dollars lighter too.

Remember the ABC's — Savings of this type can be translated into many jobs where a portable disc grinder is used. Basic techniques are simple, but often the operator develops sloppy grinding habits without being aware of it.

Generally prepaint or preplate preparation of a sheet metal product with a portable disc grinder calls for removing die marks, grinding off or blending welds, smoothing over arc weld pits and folded corners, and sanding the entire surface to hold a finish coat. Flaws in procedure often can crop up to spoil the job.

Five of the most common disc-grinder-caused blemishes in sheet metal finishing are: Burned spots, deep scratches in the work, flat areas and depressed spots, circular grinding marks and wasted discs. Here's a rundown of causes and cures for each of them.

BURNED SPOTS

Burned spots usually show as bluish discolorations of the metal surface, indicating excessive heat has been generated which has drawn the temper of the steel. Burned spots are caused by slow movement of the grinder across the work, applying too much pressure, or using a worn out or glazed disc.

Keep Moving — When polishing metal, the grinder should be kept moving across the work constantly. One-second timed strokes two to three feet long are best for flat work on 24-gage or heavier stock. A faster working rhythm is recommended for polishing curved surfaces where contact area is smaller and working pressures greater. Use stiff backing pads for flat surfaces, flexible pads for curved surfaces.

Excessive working pressure — usually a result of the operator attempting to compensate for other faults in his grinding technique causes heating or burning of the work, slowing grinder speed and glazing or loading of the disc.

Correct grinding angle

Crossing grit lines with subsequent strokes

The Easy Way — Disc speed — not high pressure — is the primary factor in metal removal. Pressure applied to the grinder should be no more than is required to hold a 1-inch wide rim of the disc against the work with the tool spindle inclined at about 75 to 80 degrees from the surface.

Grinding speed depends on horsepower of the grinder and diameter of the sanding pad. With a full grinding load, a seven-inch disc should turn at least 4600 rpm; a nine-inch disc at more than 3600 rpm. Brake horsepower of a 7-inch grinder that turns a 16 grit disc at recommended grinding speeds should be at least 1 hp. A grinder on which a 9-inch 16-grit disc is used should develop at least 1.5 hp at grinding speed.

Rule of Thumb—Where correct sanding disc size is not marked on the sander, it can be determined from maximum horsepower specifications. In grinders not equipped with speed governors, maximum horsepower usually occurs at half the free speed, with speed governors at about three-fourths the free speed.

Disc glazing occurs when spaces between the abrasive grains have been filled with grindings from the work or grain cutting edges have been dulled. Consequently, abrasive grains cannot penetrate into the work but rub over the surface, generating heat but not removing material. Avoid disc glazing by choosing the proper disc for the job and running it to speed.

Proper Selection—Choice of disc grade and type depends on material to be ground and type of finish required. As a general rule, coarse grades of coated abrasives (16 to 50 grit) are best for fast removal of metal. Fine grit (60 and finer) discs produce good finishes on sheet metal for painting, plating or bluing.

Two major classifications of sanding discs are open and closed coat types. Abrasive grains on open coat discs are spaced about a grain-width apart (discs 50 to 70 per cent covered) to offer a place for grinding to go without lodging between adjacent grains. Closed coated discs have grains mounted with no space between them (discs 100 per cent covered) and cut more aggressively than open coat because of the greater number of cutting edges per square inch.

Load Resistant—Since heat resistant resin bonds have been developed for sanding discs, open coat discs are little used for metal grinding work. Chief applications today are for grinding of such relatively soft materials as some types of aluminum, fill solder, and paint (in rework jobs), where tendencies to fill the disc are great. Closed coat discs are used on harder materials where ground particles are relatively small and do not tend to weld together.

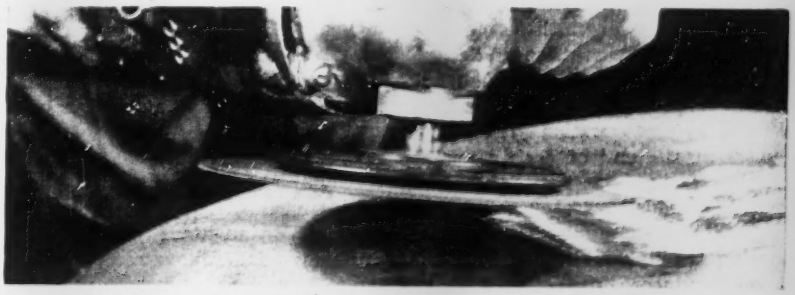
DEEP SCRATCHES

Deep scratches in the work can result from using disc of too-coarse grit or a partially glazed disc, from dirt or loose metal on work, loose grit on the disc, or from not crossing grain lines when changing from a coarse to a finishing grit disc.

When removing welds or hammer marks with a coarse disc, grinding should be limited to the immediate area involved. Final grinding with a fine grit disc will be easier.

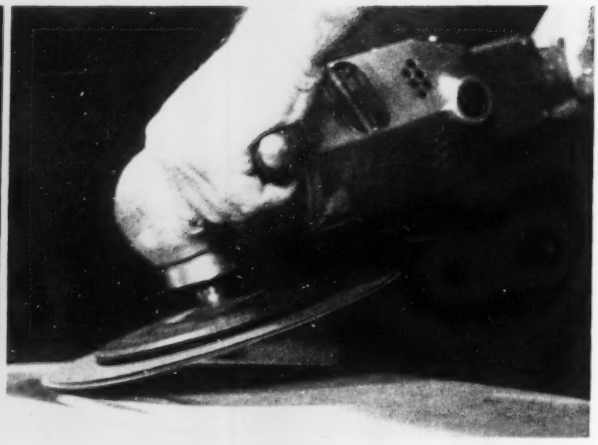
Welded Grains—Filled discs not only generate excessive heat, but also carve deep scratches in the work. Metal grindings lodged between grains weld together and form piles of metal on the disc that gouge the surface.

Many deep scratches can be pre-



Correct lifting angle at end of stroke

Burned spots (dwelling too long in one spot)



Incorrect disc angle

vented simply by keeping the work clean. Dirt or loose metal on the work will be caught between grains on the grinding disc and scar the surface being finished. Small beads of solder, steel filings or turnings, rust flakes, loose paint and other foreign material should be swept from the surface periodically.

Moving High Spots—Loose abrasive grains will also put deep scratches in the work. If a grain breaks from the backing it tumbles through the other grains still attached, producing a moving high spot on the disc that cuts deep wild grain marks. Use of resin bonded discs lessen this problem as grains will not dislodge.

Flanged nut holding the sanding disc to the back-up pad can also gouge the work. To prevent contact, never hold sanding pad flat on the work but at an angle of about five or ten degrees from the surface being ground.

FLAT AREAS, DEPRESSED SPOTS

Flat areas in finished work show up where the metal has been ground thinner than desired. On a painted surface, these areas usually form lines that indicate the ends of the grinding stroke in the prepaint sanding operation. To avoid their formation lift the sander at the end of each stroke.

By reversing stroke without lifting the sander, operator grinds a longer time in one spot than when passing through mid-stroke. Repetition produces lines of extended low areas that permanently divide the surface into distinct rectangular sections.

Ride Over Lows — Depressed spots are shallow dips in raw sheet metal that become waves in the painted product. By using a relatively hard pad to back up the sanding disc, these depressed spots can be removed.

The hard pad will ride over depressed areas and grind the high surrounding area down to match. Soft backing pads follow contours of the surface too closely, forcing grinding disc into shallow spots and aggravating the condition.

CIRCULAR GRINDING MARKS

Circular grinding marks, apparent through the final paint, stem from using a too-coarse disc on the final grind operation, not crossing grain marks in final sanding, or holding disc at too steep an angle with the work.

Finish Grinding—Quality of the finish ground on raw sheet metal improves directly with the rotational speed and grit density on the sanding disc. For steel, a 120 grit disc pad turning 5000 rpm can produce a finish of 18 micro-inches. When finishing a surface that is first ground with a coarse disc, strokes should be at right angles to those in the previous operation.

Crossing grind lines is the quickest method of producing a uniform finish. By moving across previous grind lines only ridges are removed. Valleys receive minimum grinding. Blending from one area to another is easier by cross grinding because the abrasive makes new grooves and removes existing flats and depressions. Operations can be controlled more accurately by cross grinding as previous marks can be watched easily.

What's the Angle?—On flat surfaces, sander should be held at angle shown in the photo. When disc is bent too sharply sanding pressures are too high and grains are forced into the work in irregular patterns and in too narrow a grinding band at the bend in the pad. At the proper angle, pad holds disc against work at a constant pressure across a grinding band wide enough for easy blending.

WASTED DISC

Where both nine and seven-inch sanders are used, worn out nine-inch discs can be cut down and reused. This is possible because when properly used, only a $1\frac{1}{4}$-inch rim of abrasive is worn off the disc. In effect, this practice doubles life of nine-inch discs.

Try Curves—Worn discs no longer practical for flat surfaces will still cut well on curved surfaces. Here unit pressure is greater and dulled discs will continue to grind. Avoid using loaded or glazed discs here though.

If clean worn discs are used, there is no danger of making deep scratches or burned spots because grains will cut, not rub. Worn discs will actually produce a finer finish than is possible with a new disc of the same grit number.

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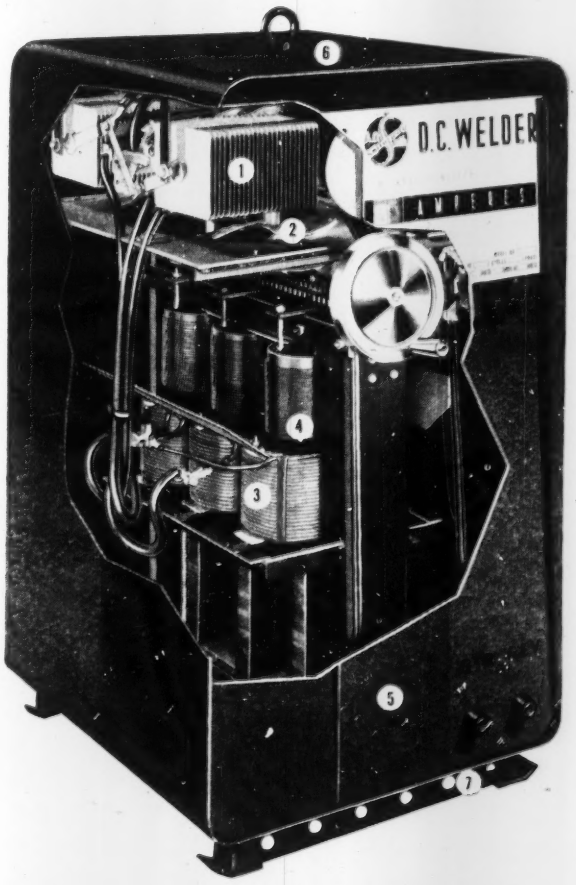

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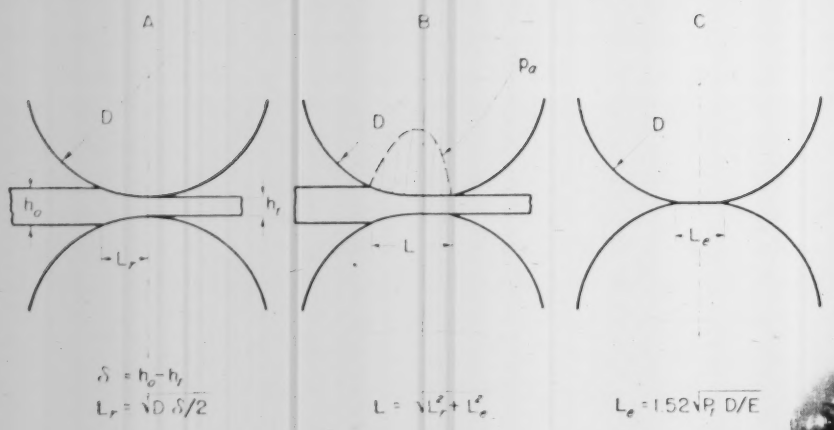
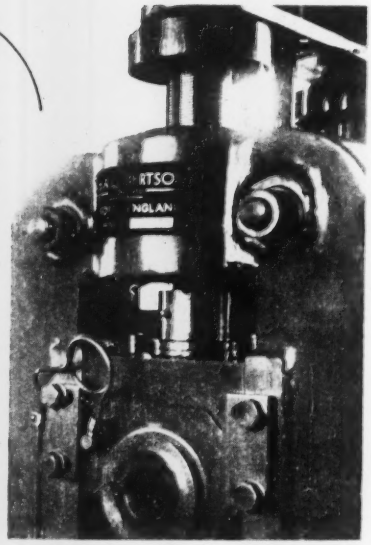


Shape and length of contact: a) between rolls and strip assuming rolls to be perfectly rigid; b) as in (a) but with elastic rolls in "flattened" condition; c) between two rolls pressed together without strip. Screw pressures assumed equal. Curve p_a indicates pressure distribution in roll bite



Compression testing machine for measuring roll separating forces is in position between the screw and bearing block

Evaluating Rolling Pressures

This review and brief analysis brings to light much needed data on direct measurement of roll separating forces under operating conditions

By N. H. POLAKOWSKI
Sendzimir Ltd.
London

KNOWLEDGE of mill loads and specific roll pressures is of importance to both designers and users of strip mills. For many years work has been going on partly in rolling plants but mostly in laboratories and research establishments, to measure and evaluate these loads on a variety of mills and metals under different rolling conditions.

However, for obvious practical reasons the greatest part of this work was carried out on relatively small and slow mills with work rolls of up to 10 inches diameter. The researches of Emicke and Lucas on the 14-inch experimental mill at the Freiburg Mining Academy, Germany, were perhaps exceptional in this respect, but they were devoted almost exclusively to rolling of nonferrous metals.

Predicting Pressures—Since the greatest quantity of commercial quality steel strip now is produced on continuous mills with work rolls of over 18 inches diameter, it is essential to know what rolling loads and pressures occur in this class of equipment. Theoretical predictions of these pressures always are based on more-or-less arbitrary assumptions and therefore involve a factor of considerable uncertainty. At any rate, the practical value of such predictions is nil unless they are first double-checked against actual, measured figures.

Unfortunately, direct measurement of roll separating forces in the stands of large hot and cold strip mills represents usually an expensive and fairly complex undertaking under working conditions. This circumstance presumably accounts for the scarcity of data of the type required in the literature on rolling of metals. This review and brief analysis brings to light some recent results of roll pressure measurements on full-size continuous hot and cold strip mills.

Measuring Forces — Beginning from the pioneering researches of Puppe nearly half a century ago, various means were used to measure the roll separating forces. These can be broadly divided into two categories:

1. Extensometers which measure elastic strain in mill housings.
2. Devices working on the compression principle which are inserted between the pressure screws and the bearing blocks.

Method No. 2 is regarded as the better and more accurate. It also has the advantage that the load measuring units can be calibrated on a compression testing machine outside the mill. A small instrument of this kind in working position on an experimental 6 x 6-inch

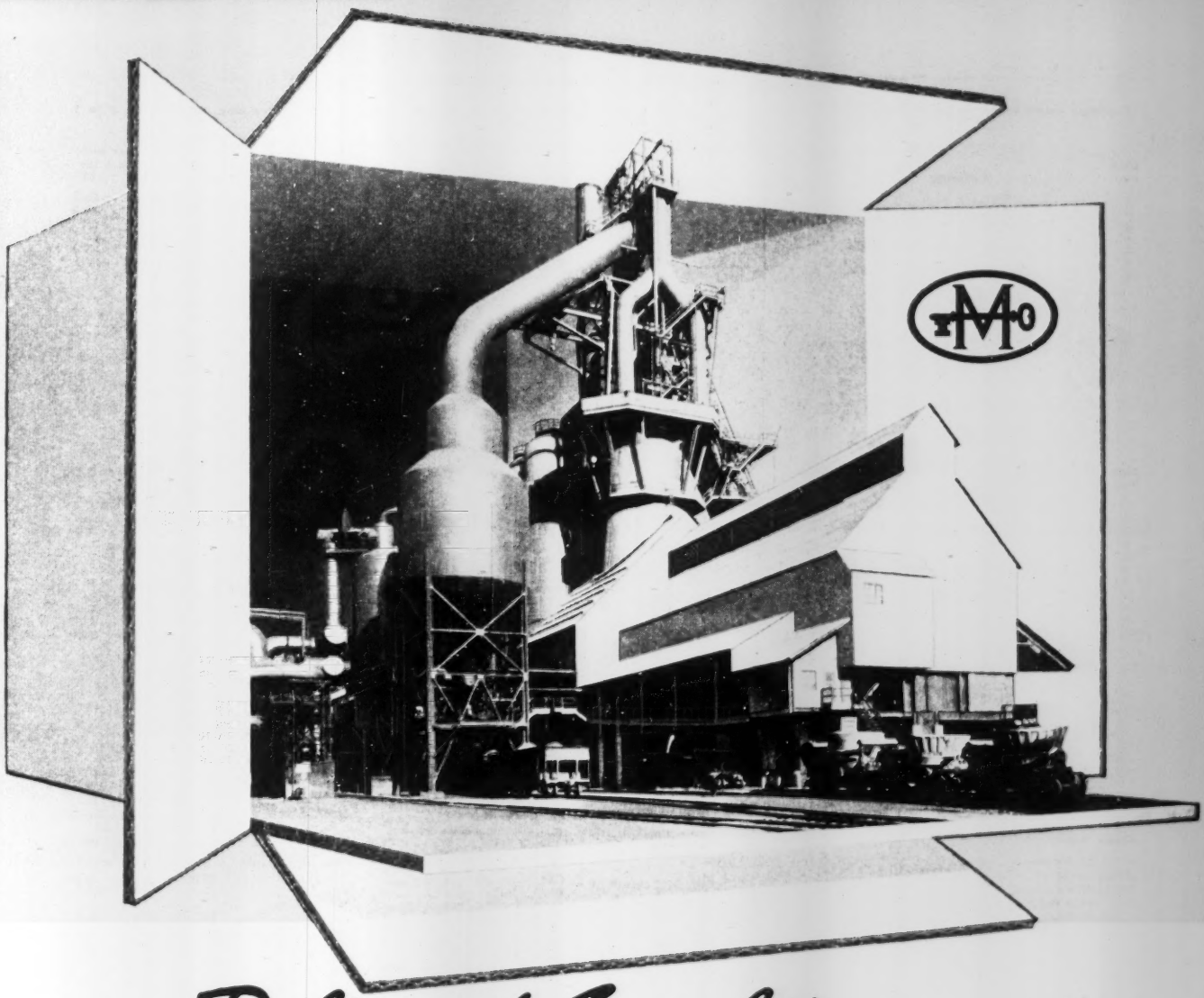


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TABLE I—Rolling forces in a 4-stand hot strip roughing mill

(Material enters stand No. I at 1215 to 1225° C and leaves stand No. IV at 1045 to 1080° C. Slabs were about 82½ inches long. Slabs Nos. 2 to 7 were cross-rolled in stand No. I, a broadside mill.)

Slab No.	Section of material in stand No. I Entering	Leaving	°C in steel*	Per cent draft in stand No. I	II	III	IV	Roll separating force per inch width of material in lbs x 10^3 I	II	III	IV
1	4.33 x 41.0	3.35 x 41.0	0.05r	26.0	29.2	31.6	34.5	38.6	29.5	33.6	40.3
2	4.33 x 35.2	3.16 x 52.3	0.10k	27.1	23.2	37.5	33.3	—	30.3	39.9	41.2
3	4.33 x 37.4	3.19 x 53.1	0.15r	26.5	28.4	38.1	35.3	38.4	33.1	43.5	41.5
4	4.33 x 35.2	3.19 x 52.0	0.20k	26.4	23.4	38.7	34.2	37.2	31.3	45.7	43.6
5	4.33 x 40.2	3.39 x 53.1	0.12r	21.2	24.9	34.9	34.7	35.8	31.7	50.7	43.3
6	3.94 x 35.2	2.93 x 51.5	0.18	25.7	29.6	33.1	37.1	36.2	34.2	45.5	51.2
7	3.94 x 35.2	2.93 x 51.5	0.18	25.6	31.0	32.5	37.9	40.0	36.3	49.6	52.5

* r—rimmed steel; k—killed steel

TABLE II—Rolling forces in a 6-stand hot strip finishing mill

(Material leaves roughing train, stand No. IV, at 1045 to 1080° C and finishing train, stand No. X, at 830 to 900° C.)

Slab No.	Section of material in stand No. I Entering	Leaving	°C in steel*	Per cent draft in stand No. V	VI	VII	VIII	IX	X	Roll separating force per inch width of material in lbs x 10^3 V	VI	VII	VIII	IX	X
1	0.527 x 37.0	0.078 x 37.0	0.05r	34.0	41.8	32.5	30.3	21.2	4.3	81.4	81.5	59.5	54.7	52.0	27.4
2	0.788 x 39.4	0.078 x 39.4	0.05r	47.0	41.5	35.0	31.0	23.0	7.5	73.6	68.6	55.9	50.8	41.9	23.7
3	0.560 x 34.7	0.098 x 34.7	0.05r	40.7	36.4	35.3	34.7	16.6	11.2	70.2	81.6	61.8	61.5	57.0	36.2
4	0.906 x 39.4	0.118 x 39.4	0.05r	54.4	54.1	30.0	33.6	15.5	11.5	63.6	70.9	48.6	51.4	43.6	23.5
5	0.906 x 36.7	0.118 x 36.7	0.05r	47.5	47.1	28.0	28.3	18.1	11.0	66.5	65.4	48.0	45.0	45.0	25.8
6	0.943 x 39.4	0.118 x 39.4	0.10r	43.5	36.8	28.4	28.3	21.8	6.7	67.6	61.4	52.0	47.5	38.0	23.4
7	0.906 x 39.4	0.118 x 39.4	0.12r	51.5	50.0	29.0	31.5	12.5	16.6	68.1	72.5	56.5	54.2	47.5	26.2
8	0.943 x 39.4	0.118 x 39.4	0.12r	54.0	54.0	33.6	26.1	17.3	15.3	66.5	70.9	56.2	50.3	46.9	23.4
9	1.063 x 43.6	0.217 x 43.6	0.25r	51.2	52.1	33.1	26.0	16.7	8.5	63.8	52.7	43.9	41.3	31.1	18.8
10	0.906 x 39.4	0.059 x 39.4	0.15r	42.2	37.0	31.0	34.2	11.0	16.3	72.7	72.5	58.1	58.1	54.2	33.5
11	0.866 x 39.4	0.118 x 39.4	0.15r	46.2	45.8	31.0	29.8	16.4	12.2	70.9	63.0	51.4	50.3	47.2	23.4

* r—rimmed steel; k—killed steel

TABLE III—Rolling pressures in two 5-stand tin plate mills

(Ebbw Vale and Weirton) and in a 3-stand cold sheet mill (Zaporoshye)

Stand No.	EBBW VALE Delivery speed, 1300 fpm 0*	I	II	III	IV	V	WEIRTON Delivery speed, 1000 fpm 0	I	II	III	IV	V	ZAPOROSHYE Delivery speed, 600 fpm 0	I	II	III
Strip thickness h_n, in.	0.063	0.060	0.040	0.026	0.017	0.011	0.091	0.0653	0.0415	0.0247	0.0157	0.0098	0.1064	0.0662	0.0513	0.0473
Draft, δ, %		27.7	33.3	34.8	34.9	34.2		24.0	40.1	40.5	36.1	37.5		37.8	22.4	7.69
Overall reduction, %		27.7	51.8	68.6	79.4	86.7		24.0	58.3	72.8	82.7	89.2		37.8	51.8	55.6
Roll force per in., P_1 lbs x 10^3		62.3	37.3	37.3	43.8	46.9		41.3	49.6	39.7	48.6	47.0		53.1	40.5	26.8
Mean roll pressure, p_m lbs x 10^3 per sq. in.		112.0	75.7	86.3	113.3	132.6		76.3	81.0	80.5	117.0	128.0		78.2	99.0	96.4
Contact length-thickness ratio L/H		7.8	9.0	13.2	18.0	25.4		6.8	11.0	14.9	20.6	28.9		7.86	7.65	5.65

* Pay-off reel (thickness of hot rolled band)

mill in the author's laboratory is shown in the photo. Details of construction of pressure meters for rolling mills were described in the technical press.[1]

Evaluating Them — For more convenient use, all the values of roll separating forces P_1 listed in the following refer to a unit (inch) of strip width and have the dimension lbs in. On the rigid-roll assumption, the average nominal roll pressure psi is $p_r = P_1 L_r$, where $L_r = \sqrt{D\delta}/2$, D being the roll diameter and δ = draft.

Reel rolls deform elastically under load and their surface "flattens" when being pressed against the rolled strip. The actual contact length L is thereby increased above the rigid-length value L_r and allowance must be frequently made for this extra increase.

Here's How—The work rolls are visualized as if pressed together by the actual roll force P_1 but without the strip between them. The length L_c of the elastic contact surface thus formed can be determined from the well-known Hertz formula as $L_c = 1.72\sqrt{P_1 D/E}$, where E is the elastic modulus of the roll material. For steel, whether cast or forged and hardened, E is approximately 30×10^6 psi. After computing L_r and L_c, the total flattened contact length L is found from $L = \sqrt{L_r^2 + L_c^2}$. Accordingly, the average actual roll pressure psi, where $p = P_1/L$, is always less than p_r for the same pass.

With the foregoing data in hand it is possible to estimate the maximum unit pressure between the strip and the rolls. Assuming the pressure distribution over the contact are to represent roughly a semi-ellipse, as shown dashed in Fig. B, the peak pressure p_m = $p(4/\pi) = 1.271\,p$.

Hot Mill Pressures—Many pertinent data are contained in a recent article by Rokots'yan[2], and these will be reviewed in some detail. He carried out his tests on a 66-inch hot strip mill consisting of four roughing stands and a 6-stand finishing train. All stands were of 4-high design with 37.4-inch diameter work rolls in the first or

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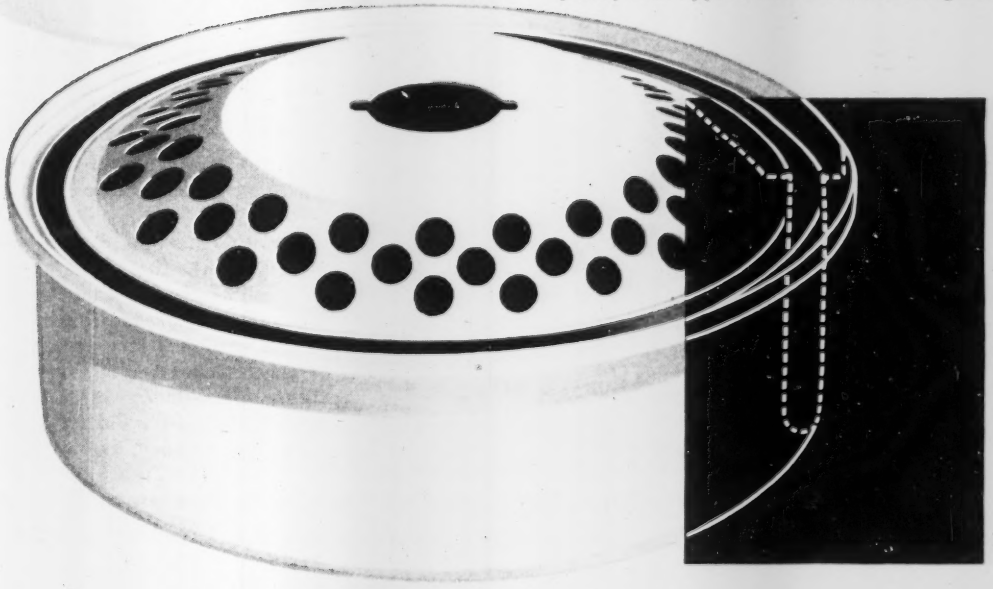

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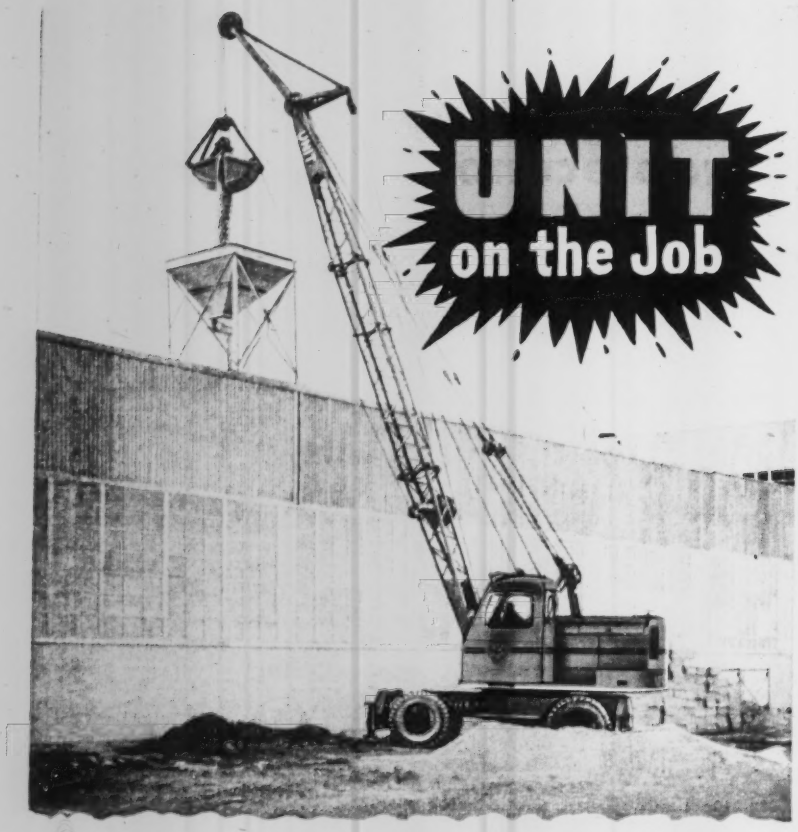

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broadside stand and 23.6-inch work rolls in stands II to X. The roughing stands were each driven by a 3000-horsepower ac motor, while the finishing train was powered by six variable speed dc motors of 3500 hp each. The delivery speed from stand X could be varied from 770 to 1770 fpm, and this writer has reasons to believe that the mill in question is that installed in the Zaporoshye steel works in 1937-39.

Rolling loads were measured by method No. 2. Short steel cylinders $17\frac{1}{2}$ inches in diameter and about $3\frac{1}{4}$ inches high, each carrying 12 resistance strain gages, were placed under the screws. These were connected to a multichannel oscillograph through a suitable amplifier, and the pressure curves were recorded on a cinematographic film. A set of results obtained in rolling of a variety of low-carbon steels is reproduced in Table I.

With the exception of steel No. 1, all other slabs were cross-rolled in stand No. I and total roll loads of up to 3.3 million pounds were recorded. A superficial comparison of the figures indicates somewhat higher loads when rolling steel with over 0.1 per cent carbon, as could be reasonably expected. The differences become much more apparent when the data are recalculated into specific pressures psi. Thus in test 1 the pressure p_r was 8.25 $\times$ 10^3 psi in stand No. I and 15.5 in stand No. V; in test 7 these values were 9.25 and 23.6 $\times$ 10^3 psi respectively.

Length-Thickness Ratios—As is well known[3], the specific rolling pressure increases when the ratio (contact length : mean strip thickness in the bite) increases. Denoting the thicknesses of the strip entering and leaving an N-th stand by h_{N-1} and h_N respectively, the average thickness in the roll gap is $H_N = (h_{N-1} + h_N)/2$. For example, the mean thickness in stand No. III (hence $N = 3$) is $H_3 = (h_2 + h_3)/2$, and so forth. The aforesaid length-to-thickness ratio is therefore L/H_N.

After carrying out the simple calculations it will be found that in the previous example these ratios were respectively 1.18 and 1.26 for the two materials in stand No. I, and 1.93 and/or 2.05 in stand No. IV. Hence the higher

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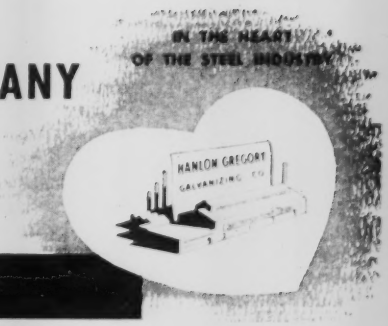

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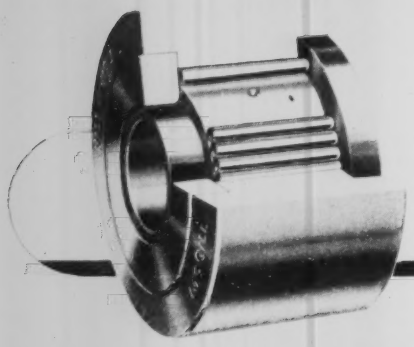

How to increase the versatility of cam follower applications

The ever increasing number of cam action applications in modern machinery is partially responsible for insuring greater efficiency and productivity through increased automatic operation. Helping to make this possible is the availability of a precision means of converting motion originating through cam action to adjacent mechanisms with an adequate anti-friction cam follower bearing.

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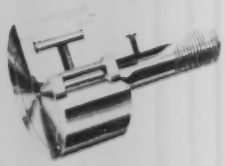

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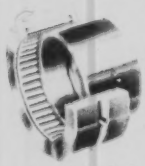

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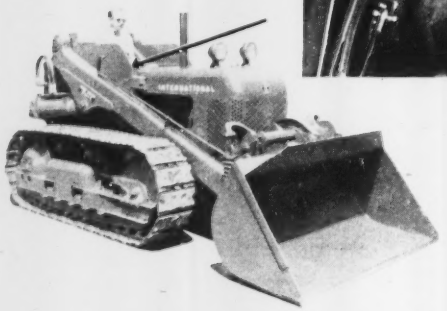
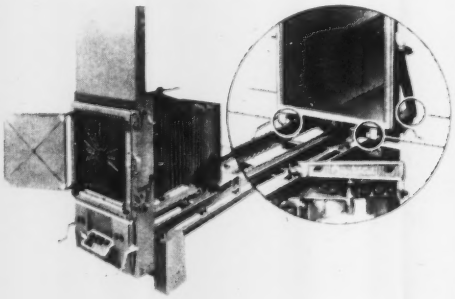


Bucyrus Erie Company, South Milwaukee, Wisconsin uses MULTIROL CYR series bearings as quadrant rollers on the operating lever that controls the bucket on their TD-9 one yard Dozer-Shovel. These bearings allow easy and free lever motion as they ride the quadrant cam in one of four positioning pockets. McGill GUIDEROL bearings are used in the PVT hydraulic unit on this same Dozer-Shovel.



Typical of the varied uses MULTIROL CYR bearings can satisfy are the track rollers on the highly precision Process Copy Cameras built by Consolidated Hammer Dry Plate and Film Company of Chicago, Illinois. Here four CYR bearings support and guide the copy board along rails before the camera. These bearings permit free and accurate adjustments for sensitive camera focus.

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psi's in stand No. IV are partly due to the higher L/H_X ratios in this stand compared with stand No. I. The prime reason for the difference is, of course, the gradual cooling of the slab as it proceeds from one stand to the other.

Finishing Stands — Table II shows data obtained on the finishing train (stands Nos. V to X). The roll loads per inch are high in the first two mills but they fall off towards the delivery end of the train. On the average, stand No. X carries only one-third to one-half the load of stand No. V, this being due largely to the relatively light draft in the finishing stand.

In view of the substantial thickness and softness of the steel in Nos. I to IV stands, the effect of roll flattening on specific roll pressure could be safely disregarded. But this is not always admissible in the finishing mill and especially in the last two to three stands when the strip being rolled is relatively thin. A few examples will illustrate this point best and the rolling schedules Nos. 1 and 9, Table II, will be selected for analysis. These two schedules represent extremities as regards the thickness of the finished strip which was thin in schedule No. 1 (h_{10} = 0.0788-inch) but rather heavy in schedule No. 9 (= 0.217-inch).

Rolling Loads Decrease — Because of the lighter draft, the rolling loads were consistently lower in the second case. Specific nominal pressures psi (= p_r) computed for stands Nos. V, VIII and X follow:

Nominal pressures, psi (= p_r)

Schedule No.	Stand No. V	VIII	X
1	29.2	74.4	136.0 × 10^3
9	24.2	39.4	38.7 × 10^3

However, with due allowance for roll flattening, the actual pressures are as follows:

Actual pressures, psi (= p)

Schedule No.	Stand No. V	VIII	X
1	28.8	68.2	91.0 × 10^3
9	23.9	38.0	36.2 × 10^3

It is clearly seen that the effect of roll surface distortion is negligibly small throughout the mill for the heavy strip No. 9. But with the thin material No. 1 the effect of roll flattening becomes already distinct in stand No. VIII and large in stand No. X. On the rigid roll assumption the effective roll pressure psi in stand No. X is overestimated by almost 50 per cent.

Billet Handling a la National Tube

What appears to be piled lumber is steel billets being unloaded and stored in the yard at U.S. Steel's National Tube Division in Lorain, O. They use a 30-ton Lorain self-propelled crane and a 45-inch magnet to unload from 5 to 6 carloads every day. Billets weigh about 325 pounds apiece and crane handles up to 18 at one time. Billets will later be rolled into pipe skelp

The large differences between the pressure values in stands Nos. VIII and X for the two schedules may be accounted for on two grounds. First, the thick strip No. 9 presumably lost much less heat during the passage through the mill and its resistance to deformation in the last stands was therefore lower than in the case of strip No. 1. Secondly, the L/H_X ratios were also higher with the thin material, as seen from the following comparison:

Schedule No.	L/H_V	L/H_X	L/H_{10}
1	4.78	6.30	3.73
9	3.04	3.54	2.76

Tandem Mill Pressures—Certain values of roll pressures encountered in five-stand mills were quoted by Keller[4]. Further data became available since and these are shown in Table III.

The first series refers to the Ebbw-Vale tin plate mill and is quoted after Pearson[5]. This mill was installed in Great Britain in 1939 and it represents a rather slow unit by today's standards. The other set of data was recorded by Stoltz and Brinks[6] on the fast Weirton mill at delivery speeds from 3600 to 4000 fpm. The third one was taken on a 3-stand tandem mill of 1939 design suitable for reducing to sheet gages (19 and 49 by 66 inches, 3 × 1500 hp × 500 hp, max. 630 fpm).

Possible Error—The surprisingly high pressure psi in the first stand of the Ebbw-Vale mill is unlikely to be correct and may perhaps be due to a defect in the extensometer-type pressure meter. In the Weirton tests, compression type load meters were utilized, similar to that in the photo. However, since only two gages were available, pressures could not be measured simultaneously on all stands.

Only after one coil was finished could the meters be moved from one stand to the next. The drafting schedule of the Weirton mill was worked out from the speed relationship of the stand motors. The draft figures given for the same mill in a recent paper by Stone[7] show minor deviations from those given here, but these discrepancies are too insignificant to warrant special consideration. Interstand tensions, ran on the average at

about one-third of the yield strength of the strip. The tension in the strip leaving stand No. 5 was much lower in view of the limited output of the reel motor.

Pressures Are Similar—A comparison of the first two data sets reveals that apart from the irregularity in the first stand referred to above, the specific roll pressures are nearly the same in the two tin plate mills, in spite of the large difference in rating. As could be expected, roll flattening plays an important role in cold rolling with large diameter work rolls. If this factor were disregarded, the nominal pressures psi would appear to be higher than those indicated in Table III. The increase would be about 10 to 15 per cent in stands Nos. I-III, 30 to 35 in stand No. IV, and 50 to 55 in stand No. V.

Tensions recorded on the Russian 3-stand mill were from 27 to 30,000 psi between stands Nos. I and II, and from 20 to 25,000 between stands Nos. II and III. The strip was coiled on the take-up reel under tensions varying between 8500 and 13,000 psi.

Other Considerations—The unit pressures p in stand No. I of this particular mill are close to those found in rolling tin plate. In stands Nos. II and III the sheet mill shows rather higher figures in spite of the lighter draft. This is most likely due to the fact that in tin plate rolling the lubrication is by palm oil whereas in three-stand mills mineral-base soluble rolling oils are used.

As is well known, the latter have much poorer lubricating properties than the first and give rise to higher coefficients of friction between the strip and roll surface, with attendant higher roll pressures. Sand blasting No. III work rolls tends to increase the pressure required for accomplishing a specific reduction of thickness.

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Chrome Carbide Makes Bid

Lustrous finish and extreme hardness is attracting application interest in industry

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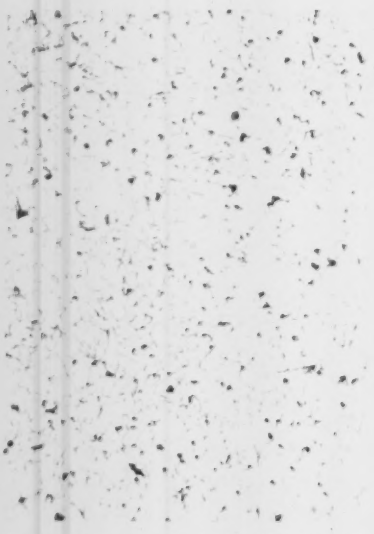

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With present facilities and equipment, parts can be produced that have a maximum length of 8 inches. Maximum diameter that can be produced is 6 inches. Undercuts and re-entrant profiles are limited by sintering hazards and machining operations that can be performed on the presintered compact. These operations include turning, boring, grinding, etc. After final sintering, the hardness of the material is such that only grinding, lapping, diamond chip machining or electrolytic machining operations are practical.

Physicals — Hardness of grade 608 chrome carbide, 88 Rockwell A, is greater than that of heat treated steels, and falls in the middle of the hardness range for tungsten carbides at room temperature. In weight, 608 is slightly lighter than steel, and two pieces of the metal weigh as much as one piece of cemented tungsten carbide of the same dimensions.

Transverse rupture strength of chrome carbide is 100,000 psi. Transverse rupture strengths, incidentally, are used for comparing strengths of cemented carbides because tensile test results are not usually considered reliable when such hard materials are involved.

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However, many thousands of homes are not enjoying their television as they should because of inadequate wiring. People in these homes obtain mediocre performance from their sets and are unable to do other things at the same time the set is on because a lamp or some other appliance has to be unplugged to make way for TV.

INADEQUATE WIRING MEANS LOST SALES

In the case of appliances whose function can be performed by some other form of energy, such as gas, our electrical industry is paying a heavy penalty in lost sales opportunities because of inadequate wiring.

We all know how difficult it is to portray these future possible uses of electricity to a customer who is not now enjoying them with sufficient force and reality to convince him, when he builds or buys a new home, of the necessity of investing now in sufficient copper, convenient outlets and switches to provide for the inevitable future which lies before him.

Maybe we never can, but we should be able to convince him of the importance of a basic foundation which will enable him to add to and expand his wiring as the need develops without tearing the house apart and starting over.

REQUIREMENTS FOR GOOD WIRING

Entrance capacity to provide for future needs, availability of 230 volts at the panel for future additions of heavy-duty appliances, enough circuits so that there is some room to grow, a distribution center from which additional circuits can be readily taken off, and copper large enough so that you don't blow a fuse every time you start a room cooler

these are the foundations for a wiring system that can be adequate today and can be kept up-to-date as we progress toward Better Living Electrically.

MONSANTO ENGINEER OUTLINES PROGRAM FOR KEEPING INDUSTRIAL POWER FLOWING

ON THE NEXT PAGE, Charles E. Knight, plant engineer since 1948 for the Springfield, Mass. headquarters of Monsanto Chemical Company's Plastics Division, discusses the details of a well-rounded maintenance program for industry. Hard-working, likable, Mr. Knight has risen in only a decade with Monsanto from draftsman to his present important position. He was graduated from Mass. Institute of Technology in 1926, with a B.S. degree in mechanical engineering.

MAINTAINING

Electric power is a basic making the distribution

by C. E. Knight

PLANT MAINTENANCE and electrical engineering officials are best qualified to counsel management on present and future electric power needs.

ELECTRICAL power is one of the most important raw materials in modern industry, particularly since its use and distribution is not limited to a few departments, but is plantwide. As a result, an interruption in the delivery of this important raw material to any department can cause a major interruption of production. Enlightened plant management recognizes this fact and emphasizes the proper management of the organization charged with the responsibility for providing and distributing electrical power. This responsibility is normally assigned to a utilities group which is a unit of the Plant Engineering department. Regardless of the organizational position of the utilities group, it is essential that they be completely familiar with and consulted on any policy changes that effect changes in the use of electricity. Sales forecasts and long range expansion plans should be available for predicting loads.

The responsibilities of the Utilities Group are, in a broad sense, to provide the necessary electric power where needed throughout the plant; to be prepared, when an interruption occurs, to re-establish the supply by immediate repair of deranged equipment or use of auxiliary equipment; to keep informed of long-term planning as it affects requirements for electric power, transformers and distribution equipment and take timely steps to fulfill increased demands.

FUNCTIONS OF UTILITIES GROUP IN PLANT ENGINEERING

In discharging this responsibility, the functions of the Utilities Group are divided into four major categories (1) Routine Maintenance (2) Preventive Maintenance (3) Preventive Engineering and (4) Long Range Planning. Because there is considerable overlap in these categories, a brief discussion of each phase may be helpful.

(1) ROUTINE AND BREAKDOWN MAINTENANCE

This is the normal daily repair work that must be done, including major repairs resulting from breakdowns. Prerequisites for adequate coverage here are: complete drawing files; specifications for all transformers and distribution systems; a trained group of electricians completely familiar with electrical equipment and distribution systems; an adequate supply of spare parts.

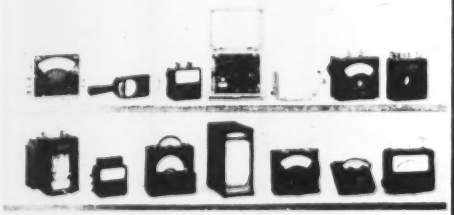
(2) PREVENTIVE MAINTENANCE

The elements of a sound preventive maintenance program are familiar to all. It is essential that this program be carried out in an orderly manner and that the responsibility for its continuation be fixed. Check lists and periodic reports are a "must." These should include such things as visual inspection of poles, insulators, manholes, condition of contacts in switch gear; filtering of transformer oil; checking relay performance by test tripping; megging feeders to determine insulation conditions; inspection of switch rooms for physical condition and cleanliness.

The installation of either meter mounts or installed meters for checking loads on critical feeder lines directs attention to overloading and will help prevent voltage loss, excessive heating and attendant insulation breakdown.

Periodic adjustment or replacement of equipment, based on failure frequency reflected in the Repair History (part of the preventive maintenance program) will go a long way toward reducing costly, unexpected breakdowns.

Where continuous operation, such as is found in the petroleum and chemical industries, makes arbitrary maintenance shutdowns financially unattractive, these inspections, replacements and adjustments must be integrated into a flexible program that can be put in motion whenever production schedules or operating emergencies dictate a shutdown.



INSTRUMENTS UNCOVER electrical system deterioration and obsolescence. The number required varies with system complexity. Here are a few used by industrial service firms.

(3) PREVENTIVE ENGINEERING

One of the most effective means of avoiding interruption of electrical service is the engineering of each change or addition to reduce the possibility of breakdown. Not only should new installations be so engineered but existing installations must be continuously studied in the light of experience and changing conditions to minimize the chance of failure. This function is one of the important duties of the Electrical Engineering group. In the location of feeders and distribution lines, such

FULL ELECTRIC POWER IN INDUSTRY TODAY

raw material for *all* industries. Here's a sensible program for system safe, adequate and less liable to costly breakdowns.

Plant engineer at the Springfield, Mass. headquarters of Monsanto Chemical Company's Plastics Division

factors as the corrosive qualities of the soil (or the vulnerability of overhead lines), location of future buildings, and probability of increased demand must be considered. The type of insulation used on feeder lines should depend upon local conditions.

IF YOU ARE INTERESTED IN REPRINTS
of this issue of the ANACONDA Forum, see your Anaconda Representative . . . or write to *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

Since most electrical distribution equipment has a relatively long life and is less subject to obsolescence than manufacturing equipment, it is generally good management to use the highest quality equipment obtainable. A few dollars saved may be wasted many times over as a result of a service interruption. Choice of cable is a practical example of this, since the cost of a cable failure, considering downtime and replacement, will probably nullify the "saving" realized in an installation of inferior quality.

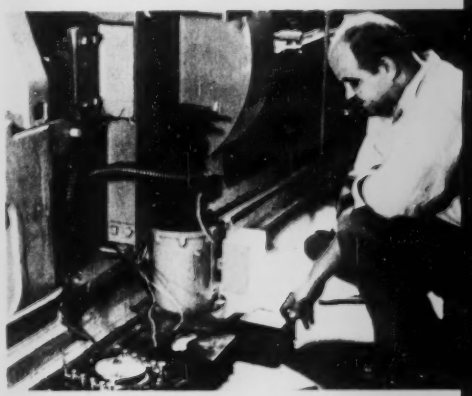
Standardization in the design of distribution systems and switch gear reduces the spare-part inventory and can result in substantial savings during alterations. The use of several transformer stations, each protected with suitable interrupting switches, tends to localize emergencies. These are but a few of the ways in which a qualified electrical engineering staff can and must aid in insuring uninterrupted supply of electrical power.

(4) LONG RANGE PLANNING

It is in this field that a plant's electrical engineering group must function as an integral part of plant management and be a part of the policy-making group where production operations and their power requirements are concerned. Forecasts of power requirements based on sales forecasts and long range expansion plans must be established and revised periodically to provide the hypothesis for engineering studies of modifications to meet anticipated needs.

This approach avoids the frequent difficulty of a distribution system growing "like Topsy," which eventually necessitates a complete and costly replacement of the entire system or inefficient use of existing equipment. Any modifications or additions to the existing system are made to allow for future requirements. The installation of manholes or feeder ducts can be made with provision for additional capacity when needed. Switch rooms and sub-stations are built so that they are of sufficient capacity or can be enlarged to handle future needs. Although electrical distribution equipment has a relatively long life, it is often made prematurely obsolete by plant expansion. The above approach can tend to minimize this problem.

(*continued on next page*)



LOAD TESTS frequently uncover mechanical defects that overload motors and cause failure.

PREVENTING COSTLY SHUTDOWNS. At Monsanto Chemical Co. inspection plays a big role in keeping power flowing. Here electricians regularly inspect such vital parts of the system as the distribution lines in a power tunnel and the main primary breakers in a substation. Even the brushes on a 700 hp. motor-generator are checked.

(KNIGHT, Continued)

KNOW YOUR UTILITY, CONTRACTOR AND EQUIPMENT SUPPLIER

Woven through the entire program for providing uninterrupted distribution of electrical power, both for current operations and for future expansion, must be the relations with the utilities company, the electrical contractor and electrical equipment supplier. In spite of the best-laid plans, emergencies will occur during which the services of any or all of these can be invaluable. In long range planning, their experience and knowledge of factors not a part of plant operation can frequently aid in formulating a more sound program. It is important that the plant electrical engineering group establish and maintain friendly relations with these organizations.

WHAT UNINTERRUPTED ELECTRIC SERVICE REQUIRES

In summary, the importance to the plant, of an electrical distribution system that is adequate, safe and maintained so as to avoid any interruption of power distribution cannot be over-emphasized. Providing this service requires: a staff of technically trained electrical engineers; an electrical shop with adequate tools and staffed with competent electricians thoroughly familiar with the system; a serious preventive maintenance program; a reliable supply of electrical equipment and cable both in the plant and/or available through a distributor; close liaison with top management on major fluctuations in or expansions to production activity. Integration of these points into a well-formulated program will produce the desired result.

ANACONDA REVIVES INDUSTRY-WIDE PROGRAM TO "POWER-UP— AND BE PREPARED"

Aimed at large industrials, "POWER-UP—And Be Prepared" tells plant executives that NOW is the time to modernize their plant wiring systems.

Utilities, contractors and distributors are being asked to cooperate in this program. Everybody benefits . . . when everybody ties in.

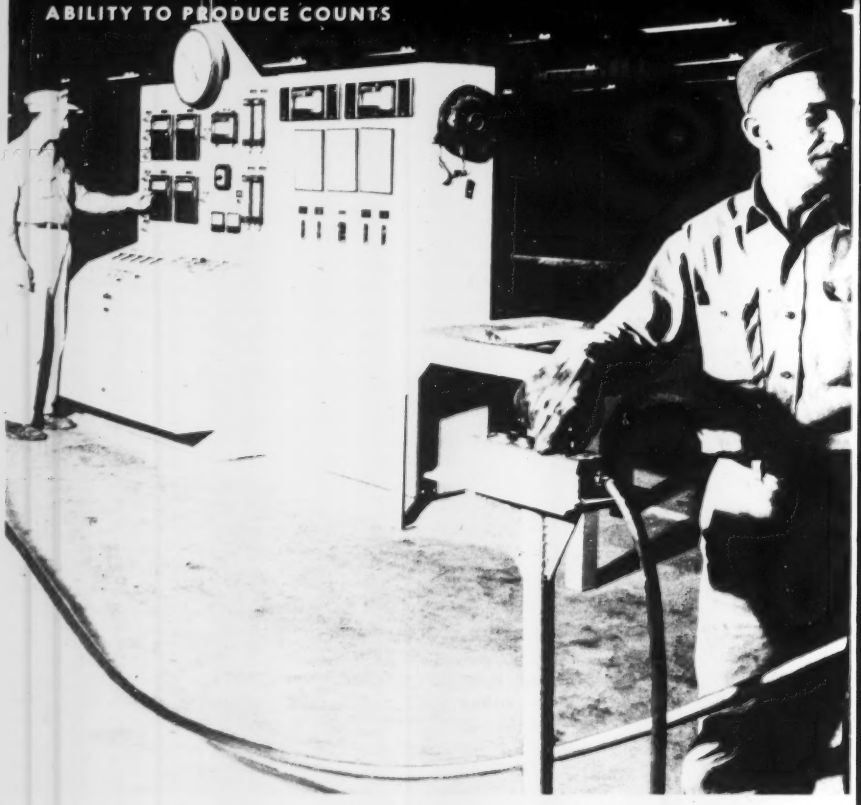
See your Anaconda Sales Office or Distributor now for full details and free promotion material.

New "Full Power Ahead" Campaign Sells Wiring Modernization to

- **farms**
- **small industrials**
- **homes**
- **commercial enterprises**

The new FULL POWER AHEAD Program means new business for contractors and distributors . . . increased power sales for utilities. Anaconda has prepared a complete tool kit of promotion material to help you get your share of today's MULTI-BILLION dollar wiring modernization market. For more information write Anaconda Wire & Cable Company today.

ABILITY TO PRODUCE COUNTS



Now he pushes a button

. . . and turns out a *better* cable faster

Old-time cable men—and younger ones, too—whistle when they watch this new lead-extruder at work at Anaconda. You touch a button . . . keep an eye on the instrument panel . . . and the cable rolls on the reel, ready to use. You don't stop for refills. This extruder works continuously.

It's a big gadget . . . and a *better* one for two reasons. It speeds up service to our customers. And it assures them of a quality product, more uniform than ever before. It's one more example of the modern methods Anaconda uses to give you better cables and cable accessories, made to standards that usually top recognized industry specifications.

In mills and mines, we've put our dollars to work in a vast program of improvement and expansion. It has three objectives:

1. *delivery of products in ample quantity to meet industry's needs.*
2. *development of new products to meet new needs or to meet old needs better.*
3. *quality consistently maintained through an exacting program of statistical control.*

Look at it from your side of the desk. You get better products, delivered faster, and lasting longer *when you specify* ANACONDA.

Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

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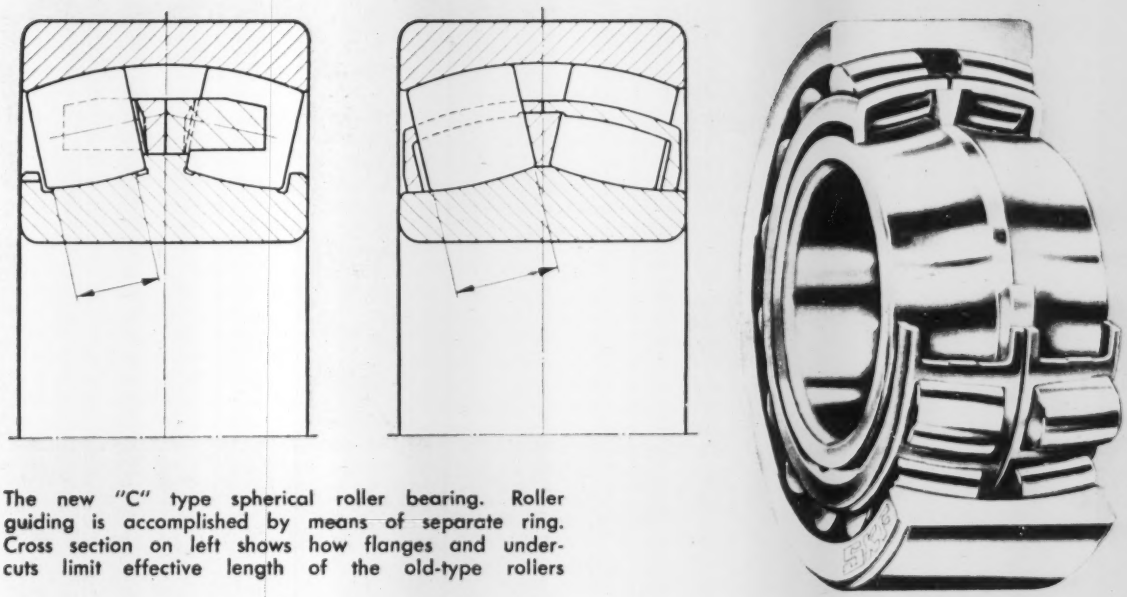
TODAY'S HEADQUARTERS FOR WIRE AND CABLE

MAKERS OF building, barn, machine tool, control and communication wire • service and overhead distribution cables, bare and weatherproof including ACSR • portable cords and cables • power and busdrop cables • mine, bridge, aerial, underground, duct, network and submarine cables • parkway, airport and street-lighting cables • station, apparatus and vertical-riser cables • magnet wire • copper, aluminum and copperweld conductors • wire and cable accessories.



The new "C" type spherical roller bearing. Roller guiding is accomplished by means of separate ring. Cross section on left shows how flanges and undercuts limit effective length of the old-type rollers

Internal Redesign Improves Bearing

New spherical roller bearing is said to offer 25 to 50 per cent more capacity plus 2 to 3½ times more service life. Flanges and undercuts are eliminated

CHANGE in the design of spherical roller bearings is said to increase capacity 25 to 50 per cent and prolong service life 2 to 3½ times.

Producer of the improved bearing, SKF Industries Inc., Philadelphia, reports the premium performance is accomplished without modifying size and weight of bearings.

Of the 40 sizes available, 15 are in stock. Their successful applications include railroad journals, vibrating screens and steel mill machinery.

Here's How—Five features are incorporated into the new design.

Integral inner ring flanges and adjacent grinding undercuts have been eliminated to provide for longer rollers and longer effective contacts between rollers and rings.

Symmetrical, barrel-shaped rollers are used, which, unrestricted by flanges, automatically locate themselves between the rings so that maximum roller diameter coincides with the maximum distance between ring raceways. Resultant roller load is always applied in the middle of the roller. This makes for uniform load distribution over the roller length.

Extremely close conformity of rollers and raceways at both rings is used. In this way, there are large areas of contact between rollers and raceways as distinguished from detrimental edge loading.

Guide—Separate ring of small width and high cross section is used for guiding rollers. Ring, which rotates with the inner ring, fills space between the two rows of rollers without exerting pressure on roller ends. It is free to adjust itself axially as dictated by the rollers. Result is effective roller guiding with minimum friction.

Mechanically strong but light window-type cage is used for each row of rollers. Cage is made of densified roller brass of high tensile strength. It is centered on two large areas, one directly on the inner ring outside of the roller, the other on the O. D. of the guide ring. Operation is said to be trouble-free even in eccentric applications, such as shaker screens.

Other Features—Where combined loads are present, bearing is capable of carrying heavier combinations of radial and thrust loads or pure thrust loads of greater magnitude.

BIG

MANIPULATOR

Alliance MANIPULATOR

INCREASES PRODUCTION FROM 200 TO 400%

This 75-ton Alliance Manipulator is the world's biggest. It handles ingots for ship shaftings . . . press columns, large naval gun barrels and other huge jobs.

At the International Nickel Company plant in Huntington, West Virginia, two 4-ton straight line Alliance Manipulators serve a single hammer . . . forging Monel metal ingots from 14"x14" down to 8"x8". They helped boost 8 hours' production to 250% of the former record capacity with less than half the number of men.

Alliance builds forging manipulators in capacities from 1 to 75 tons in the following types . . . straight line trolley only, straight line trolley with bridge, sluing trolley type, sluing trolley type with bridge and crane type. Some bridge type manipulators handle the entire job—charging, forging, discharging and delivering.

Users of Alliance Machine Company Manipulators report 200 to 400% increased production with a smaller crew.

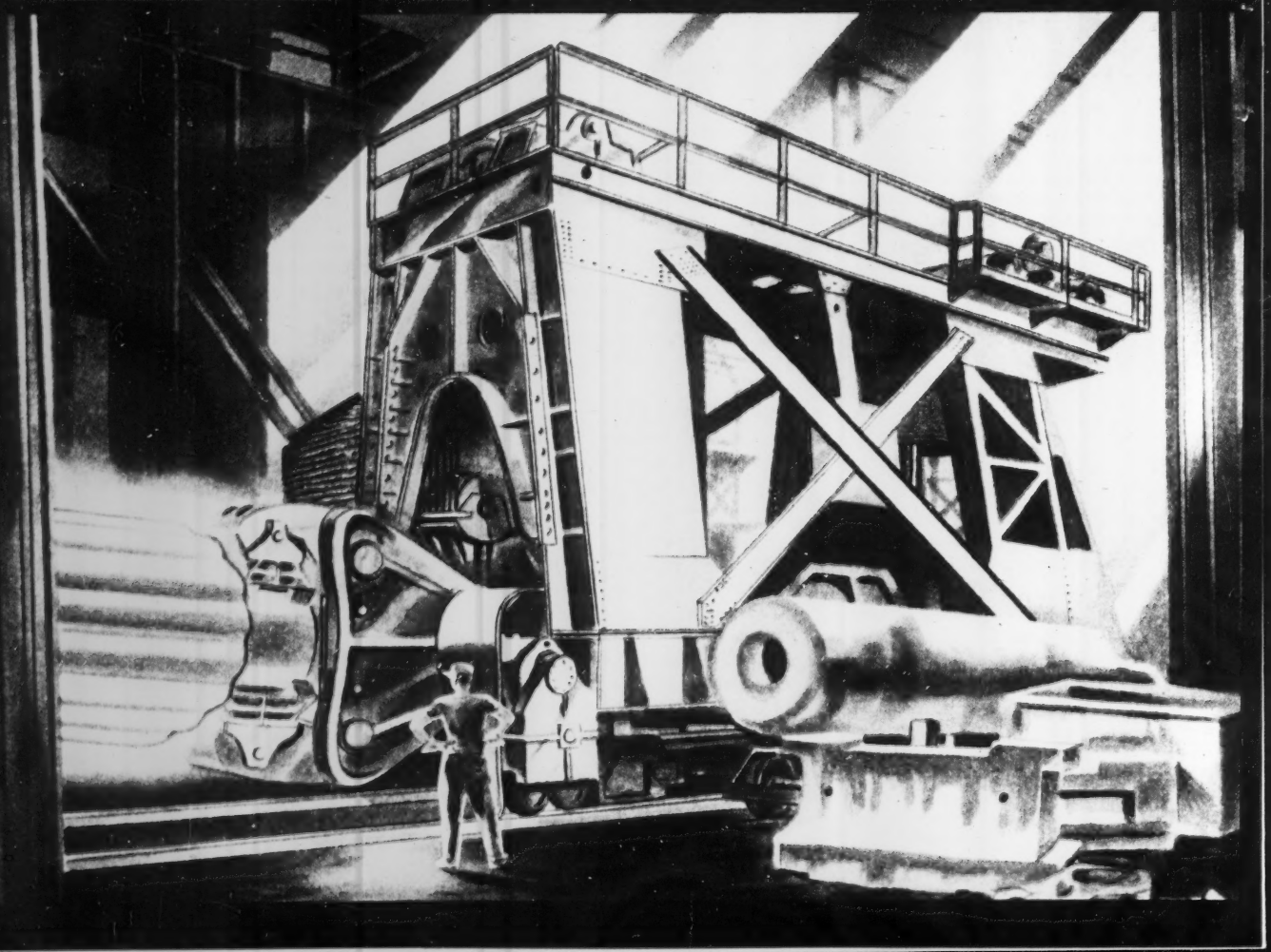
If you are not using Alliance Manipulators now, you can increase production and save money by writing us today.

THE *Alliance* MACHINE COMPANY

Main Office: Alliance, Ohio

LADLE CRANES · GANTRY CRANES · FORGING MANIPULATORS · SOAKING PIT CRANES
STRIPPER CRANES · SLAB AND BILLET CHARGING MACHINES · OPEN HEARTH CHARGING MACHINES · SPECIAL MILL MACHINERY · STRUCTURAL FABRICATION · COKE PUSHERS

Give Us The Runway And We'll Lift The World



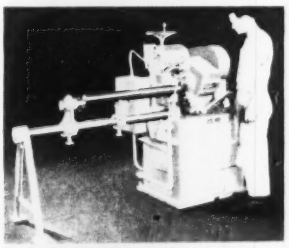
NEW PRODUCTS and equipment

Reply card on page 117 will bring you more information on any new products and equipment in this issue

Milling-Centering Machine

. . . fast, easy adjustment

Handling work from $\frac{3}{4}$ to $3\frac{1}{2}$ inches in diameter and 5 to 48 inches long, this machine's simplicity and speed of adjustment make it ideal for the steel room



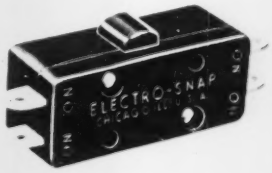
or lathe department for miscellaneous shaft work. With shaft located and clamped, rocker-type milling head mills one end which is then manually centered with a $\frac{3}{4}$-inch center drill. Part is reversed and located from center or end previously machined for milling and centering opposite end. Sundstrand Machine Tool Co., Dept. ST, Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

New Snap Action Switch

. . . for severe vibration jobs

Developed for use in severe vibration applications or for very accurate control with slow moving cams and pressure operated devices, these hammer-blow snap action switches are efficient for use on heavy presses, earth-moving equipment, aircraft and the like. Switch maintains high contact pressure of at least 45 grams until instant the contacts snap over. Contacts snap with a force of 150 to 200 grams contact pressure, reducing arcing and increasing electrical capacity. Rated at 15 amps, 125/250 v AC or 30 v DC, switch is a single-pole, double-throw type



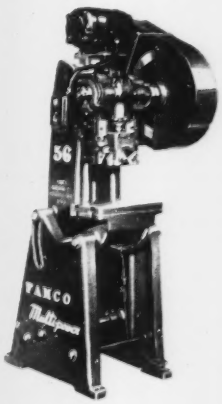
with four terminals and two seperate circuits in a space of $1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ inch. It is also available in a reset model which, when actuated, holds contacts in one position until a reset button is pushed. Electro-Snap Switch & Mfg. Co., Dept. ST, 4220 W. Lake St., Chicago 24, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Two 13-Ton Power Presses

. . . electrical or mechanical

This power press company has expanded its line to include 13-ton models featuring both electrically-operated nine-point jaw



clutch or the same clutch mechanically operated. Both models are constructed of close-grained extra heavy cast semi-steel. Both have one-piece, heat-treated alloy crankshafts, split bronze-lushed main bearings, and greater ram area. Balanced flywheels are equipped with tapered roll bearings, and either hand or automatic oiling systems are available. Famco Machine Co., Dept. ST, Kenosha, Wis.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Automatic Torque Wrench

. . . impossible to overload

This patented wrench is designed to tighten nuts, bolts and screws to exact predetermined tension, automatically, without need for

warning signals. Because of automatic trip-action feature, operator is not obliged to watch a dial, gage or indicator or observe a light or sound warning to determine the tension applied. Operator sets micrometer-style adjustment in handle to desired tension, then pulls on handle until that tension is reached at which point the wrench "breaks" automatically. No flexing of beams. It cannot be overloaded. Reasor Mfg. Co., Dept. ST, St. Charles, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Hi-Bay Reflector Lamp

. . . needs no metal reflector

This R57 reflector lamp does away with all need for auxiliary metal reflectors since it is a complete luminaire in itself, providing somewhat higher light output than the ordinary combination of lamp

and separate reflector. Available in 500 and 750 watt sizes, lamps have a hermetically sealed internal reflector made of pure silver which is guaranteed to remain brilliant

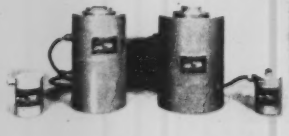
over life span of the lamp. Rated life is 2000 hours and the lamp's unique engineering design prevents dust and grime from settling on under surface of globe and obscuring light emission. Amplex Corp., Dept. ST, 111 Water St., Brooklyn 1, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Precision Load Cells

. . . interchange with standards

Two new series of precision and extra precision type SR-4 load cells for measuring forces and weights have been added to this company's line of bonded resistance wire strain gages. New series include 18 compression load cells



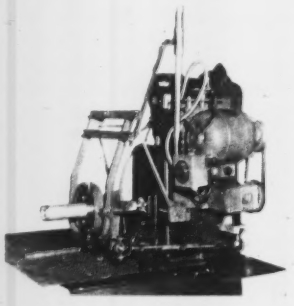
in nine capacities ranging from 500 to 200,000 pounds, and 16 tension load cells of eight capacities ranging from 500 to 100,000 pounds. Mechanically and electrically interchangeable with standard cells, essential difference between classes of cells is the finer tolerances to which cells are calibrated and temperature-compensated. Baldwin - Lima - Hamilton Corp., Dept. ST, Philadelphia 42, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Honing Machine Attachment

. . . converts manual to automatic

Recent development is this low priced automatic stroking and timing attachment for converting manually operated honing machines into completely automatic units. With the attachment, an operator can add ½ to his manual production on a single machine, or he can run several machines at the



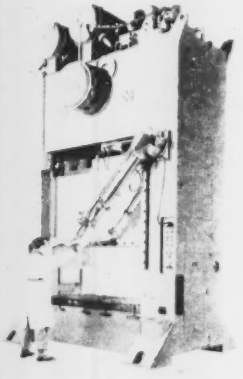
same time, depending on the work cycle. Spherical honing, previously impractical, is now placed in the realm of economical manufacture by means of a special automatic stroking attachment. National Pioneer Co., Dept. ST, 1134 Nebraska Ave., Toledo 7, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Adjustable Press Control

. . . swings clear for die changes

A pushbutton control bar suspended by universally adjustable telescoping arm is the big feature of this completely flexible method for positioning run and stop buttons of a press. With each change



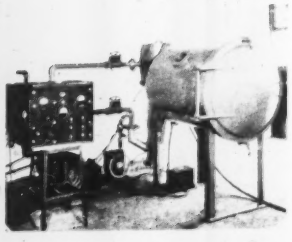
of dies or operating procedure, adjustable control bar can be relocated to conserve motion and time, thus increasing operator's efficiency, comfort and safety. When changing dies, arm can be swung completely clear of working area without blocking aisle space. Unit becomes a part of the press and does not occupy floor space. Major movements are made with worm gearing, turned from hand wheels near the control buttons, and position of buttons is both easily and quickly adjustable. Danly Machine Specialties Inc., Dept. ST, 2100 S. Laramie Ave., Chicago 50, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Small Vacuum Metallizer

. . . 30-inch unit is versatile

Development of this 30-inch vacuum metallizing unit provides efficient, economical scaled-down version of this versatile finishing process. Unlike the large equipment installations available up to now, this unit is capable of rapid



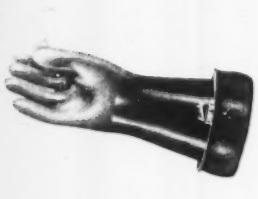
finishing cycles. With this process, initial coating of lacquer is applied to surface of the object to be finished just as it comes from the mold. A fine film of evaporated aluminum is added together with a final coating of clear lacquer to give durability to the mirror-like aluminum finish. Finish is extremely durable and is used for objects subject to continual use, such as drawer pulls, toy pistols, lamp parts, etc. High Vacuum Equipment Corp., Dept. ST, Hingham, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Non-slip Neoprene Gloves

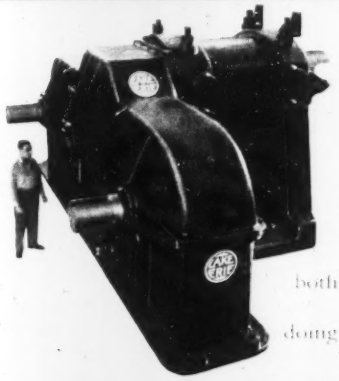
. . . have permanent finish

Combining the features of Griptite finish and the all-Neoprene glove, this permanent rough-finished glove can be used safely in



handling most delicate materials because of the absence of abrasive

Want a pleasant surprise?



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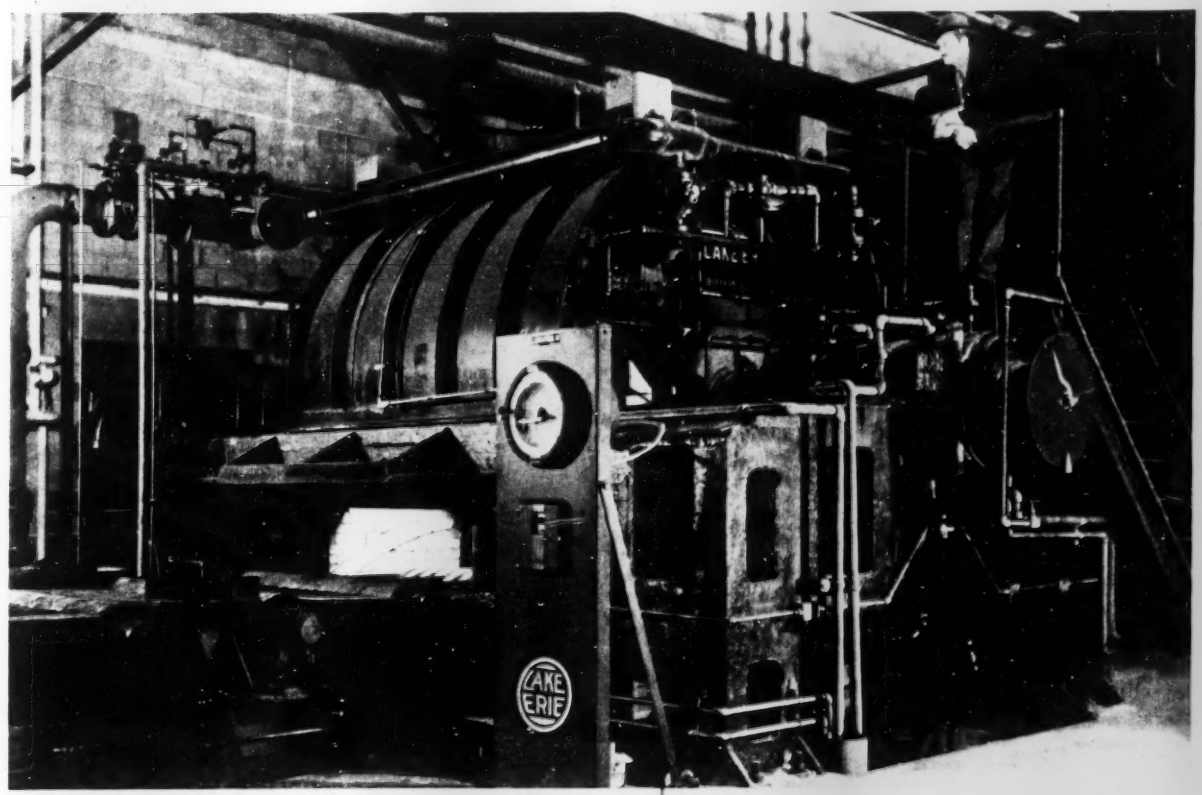
You'll find...as have industrial firms throughout the world...that Lake Erie offers the utmost in quality, price and delivery for heavy industrial machinery.

Mills in the Buffalo area (and occasionally elsewhere) have done business with us for years. The fine acceptance of our auxiliary equipment and services by both ferrous and non-ferrous industries has prompted us to expand our sales of this equipment to all areas. Ask us to quote and judge for yourself the advantage of doing business with one of the most completely equipped plants and experienced staffs in the heavy machinery field.



THE FOLLOWING WILL SERVE AS A BUYING GUIDE WHEN YOU ARE CONSIDERING REPLACEMENTS OR ADDITIONS

INDIVIDUAL UNITS

Mill tables and conveyors • Coilers and uncoilers
Shears, up-cut and down-cut • Pay-off and take-up reels • Stretcher levelers
Wet and dry scrubbers • Scrap ballers and bailers • Turn tables
Dancer roll units • Belt wrappers • Slitters and side trimmers
Roller levelers • Pilers and unpilers • Coil cradles and coil boxes
Oiling machines • Dryers • Upenders and downenders
Tension bridles • Shear gauges • Peelers and processors

COMPLETE LINES

Coil build-up lines • Sheet pickle lines • Sheet and strip shearing lines
Cleaning lines • Strip pickle lines • Resquare lines
Slitting lines • Annealing lines

PLUS REBUILD SERVICES

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HYDRAULIC PRESSES • DIE CASTING MACHINES
ROLLING MILL AUXILIARY EQUIPMENT

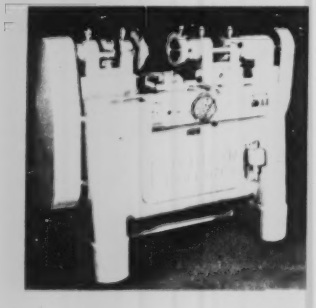
particles in construction. Gloves come in varying lengths and weights, and rough finish will not peel or chip off during entire lifetime. Regular style comes in light, medium and heavy weights, ranging in lengths from 10½ to 18 inches. The Turn-Cuff model comes in both medium and heavy weight style with lengths of 12 and 16 inches. Surety Rubber Co., Dept. ST, Carrollton, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Speeders for Gear Inspection

. . . two models broaden line

With the addition of two new models to its line of gear speeders, this company now offers a more diversified selection to its customers. Both models 1126 and



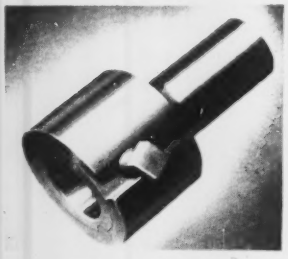
1126-A speeders are designed principally for production testing automatic transmission gears. Model 1126-A is equipped with individual drive and brake for each spindle to allow for testing of a set of gears at the same time. Model 1126 speeder has only one spindle, driven while brake loads are applied to the second spindle. A reversible single-speed motor allows spindle to be driven in either direction. Michigan Tool Co., Dept. ST, 7200 E. McNichols Rd., Detroit 12, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Non-releasing Tap Holder

. . . Monitors severe tapping jobs

Featuring a cylindrical guide for smooth exacting tapping operations, this jam proof non-releasing tap holder will monitor the most severe tapping operations without sticking. They can be used on turret lathes as well as screw machines for holding taps while cutting internal threads. Designed to incorporate a small amount of float to correct any



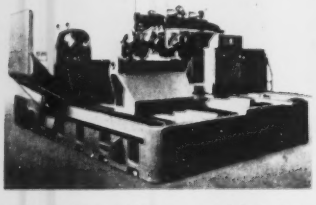
slight misalignment, extra heavy set screw will withstand long hard use, without stripping. Barnaby Mfg. Co., Dept. ST, 74 Knowlton St., Bridgeport, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Horizontal Gear Shaver

. . . works to 8-foot diameters

This horizontal precision gear shaving machine is designed for spur, helical and herringbone gears from 2 to 16 diametral pitch having pitch diameters from 24 to 96 inches. Featured are two cutter heads that speed herringbone gear



shaving operations, rapid traverse feeds on both heads which reduce setup time and redesigned controls that facilitate machine operation.

Rigid, heavily ribbed machine bed is designed to support gear assemblies weighing up to 26,000 pounds. Machine will accommodate cutters up to 12 inches in diameter, and maximum shaving range is 111 inches. National Broach & Machine Co., Dept. ST, 5600 St. Jean, Detroit 13, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Torque Control Coupling

. . . automatic compensation

RLH line of torque control couplings is designed to compensate for variation coefficient of friction by automatically adjusting normal force in inverse proportion to friction variation. Torque compensater unit can be adjusted to any predetermined torque by means of standard Allen wrench and checked by means of a standard torque wrench. Thereafter friction plates are controlled by the

compensater to supply an equal and opposite slip.

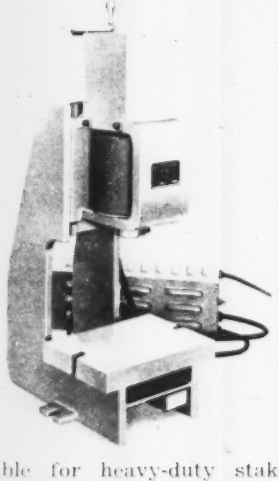
Accuracy of control is reported within 5 per cent throughout entire operating range. Buffalo Machinery Co. Inc., Dept. ST, 833-841 Grant St., Buffalo 13, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Electric Impact Hammer

. . . up to 75 blows per minute

Capable of delivering impacts adjustable from a few pounds to 10,000 pounds, this tool is particularly



suitable for heavy-duty staking, crimping, punching, forming, riveting, stamping, marking, etc. It can be plugged into any 110-v ac outlet, and draws 25 amp current only during duration of the power stroke, a mere 0.025 second.

Unit also features accurate adjustment of power head to and from work. Shut height can be ad-

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NEW PRODUCTS and equipment

justed 5½ inches, from 1¼ to 6¾ inches. Tool hole is ⅝ inches in diameter and 1 inch in depth. Black & Webster Inc., Dept. ST, 445 Watertown St., Newton 58, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

High Speed Tool Steels

. . . take on sulphide lubricants

Manufacturer is introducing high speed tool steels of regular analyses, to which are added uniformly distributed sulphide lubricants in an entirely new form. X.L. steels are unaffected as to physical properties by addition of the sulphide lubricant.

The steels are available in M-1, M-2 and M-10 types and in all sizes and shapes in which these types are normally furnished. Latrobe Steel Co., Dept. ST, Latrobe, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Rigid Plastic Pipe

. . . good chemical resistance

This rigid nonplasticized polyvinyl chloride plastic pipe features resistance to a wide range of organic and inorganic chemicals. Pipe

is reported completely immune to rot, rust and electrolytic corrosion. Relatively high structural

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70. Cutting Fluid Facts

D. A. Stuart Oil Co. A reliable guide to better machining is revised 66-page pocket-size booklet on "Cutting Fluid Facts." It is compiled to assist in improvement of machining processes through better use of cutting fluids and special lubricants. Featured is fluid selection and application chart. Accompanying the booklet is circular calculator for oil dilutions.

71. Cutting Tools

Besly-Welles Corp. High speed end mills and counterbores newly added to a company line of drills, reamers and taps are described and illustrated in catalog 78 E. They include single, double, plain and adjustable mills and straight and taper shank counterbores.

72. Drawing Brass

American Brass Co. Formbrite, a fine grain structure metal which provides a surface superior to ordinary drawing brass, is described in 12-page publication B-29. Metal was developed for forming or drawing into products on which finishing is an important cost factor. It is available in sheet and strip, as well as wire for cold heading and upsetting purposes.

73. Synthetic Hard Rubber

American Hard Rubber Co. Tempron, a synthetic hard rubber compound is subject of 4-page bulletin 96-H. This material features great rigidity and high heat and chemical resistance. It is available as molded parts, sheet, rod and tubing and standard pipe and fittings. Physical, electrical and chemical properties are given in bulletin.

74. Welding Products

Ampco Metal Inc. 24-page illustrated catalog RW-la on resistance welding alloys and electrodes includes newly designed tips and holders recently added to line. Complete data are given on other products such as seam welder wheels and projection welding dies together with reference tables and other engineering information.

75. Tough Job V-Belts

Allis-Chalmers Mfg. Co. According to 4-page bulletin 20H7786, high capacity Texrope V-belts carry 40 per cent greater horsepower rating, are oil resistant and static conducting. Where and why to use Super-7 belts is effectively shown in folder.

76. Stamping Machines

U. S. Tool Co. Multi-Slide machines, designed and built for automatic high-speed production of precision metal stampings from coil stock, are subject of descriptive 10-page bulletin 15. Many types of formed stampings can be produced complete on these machines without secondary operations or handling. Bulletin has specs for the four sizes now being built.

77. Temperature Instruments

H. O. Trerice Co. Thermometers, pressure instruments, temperature controllers and steam traps are among temperature instruments covered in 8-page bulletin 803. Typical plating installations are diagrammed. Booklet also tells why automatic temperature control is essential to plating operations.

78. Airless Blast Cleaning

American Wheelabrator & Equipment Corp. How airless blast cleaning can be used in the nonferrous foundry to effect reductions in finishing costs is shown in 4-page bulletin 901. Case histories cover brass, bronze, aluminum and allied fields. Performance data are given as well.

11-2-53

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79. Tap Manual

Threaded Fan & Tap Co. (page) "Tap Manual" contains wealth of tapping information including data on common tapping problems, illustrated tables of specifications, speeds, etc. Pocket-size for use right in the shop, manual also defines Class and thread tolerances as well as formulas for various threads.

80. Low Carbon Stainless

Armco Steel Corp.—Extra-low carbon grades of stainless steel are fully explained in available booklet. Subjects included: why carbon causes corrosion; how these special steels conserve scarce alloys; no need for carbide-dissolving anneal; clean steel fine surface; ELC stainless steels meet Huey accelerated corrosion test; and how to weld them.

81. Cranes & Shovels

Unit Crane & Shovel Corp.—"10 Reasons Why Unit Is a Better Machine" are presented in 16-page booklet of this title. "Reasons" include one-piece gear case, full vision cab, twin hook-rollers, automatic traction brakes, straight-in-line mounting, disk clutches, drop forged parts, involute splines, worm drive and heat-treated parts.

82. High Temperature Tubing

Babcock & Wilcox Co., Tubular Products Div.—A chromium molybdenum alloy tubing steel for service at elevated temperatures is discussed in illustrated bulletin TPC-116. It will withstand high operating pressures and is especially valuable for process industries service. Complete data are given.

83. Stainless Welding Wire

Alloy Metal Wire Co.—Complete information on Alloy stainless steel wire for both automatic inert gas and manual gas welding, as well as metallizing is provided in 4-page folder. Data on wire sizing, temper, spooling, tolerance and composition are also included.

84. Refractories

Corhart Refractories Co.—Brief description of Corhart, Zac and Electrocast refractories is given in illustrated 4-page folder entitled "Toughest for Abrasion."

85. Air-Operated Controls

Bristol Co.—Free-vane air-operated controllers are described in 32-page bulletin A120, including units for automatic control of temperature, pressure, fluid level, flow, humidity, pH and electrical variables. They include such new products as time-program controllers and bridge instruments.

86. Water Softeners

Illinois Water Treatment Co.—New brochure on ionXchange industrial water softeners provides complete engineering information for the accurate specification of such equipment for any application. It also shows wattage cycle of various units with complete flow rates, capacities and other specification data.

EDITORIAL ARTICLES

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87. Gas Plating

Gas or dry plating is being developed at Commonwealth Engineering Co. to point where it promises to be a major plating process. It will work with any metallic compound that is capable of being vaporized and has decomposition temperature. Metal carbonyls are particularly adaptable. Read STEEL article "Gas Plating Offers Versatility."

88. Heavy Press Operation

Progress is being made in forging large aluminum parts on 15,000-ton Schloeman press installed at Alcoa's Cleveland works. Products have surface quality, dimensional uniformity, thinner webs and ribs. A. V. Favre, chief production engineer, tells the story in STEEL article "Heavy Press Operation Takes Shape."

89. Mill Effluent Recovery

"Making Mill Effluent Pay Off" is STEEL article by R. W. Simpson and Wm. Garlow, sanitary engineers at Gilbert Associates, Inc., which points up savings in the recovery of mill scale and cooling water. These include recovery of high-iron-content scale, re-use of water, prevention of stream pollution and reduction of maintenance and scale removal costs.

90. Compressed Air System

Vital utility in fabrication of structural steel sections at U. S. Steel's American Bridge Div. is company's compressed air system. Four two-stage rotary compressors have total capacity of 6640 cfm at 105 psi. Mounted on a mezzanine, compressors serve 6 million sq ft of plant area. For a fuller description, read STEEL article "Compressed Air System Is Spacesaver," by E. P. Meixsell, Compressor Dept. manager at Fuller Co.

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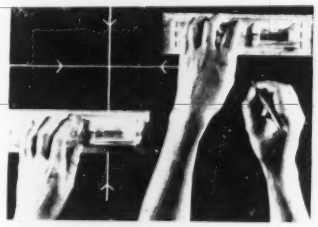
FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Pocket Drafting Machine

. . . combines tools in one

This transparent drawing instrument, capable of rolling in two directions, combines triangles, T-squares, straight edge, scales, protractor and parallel rules in one



portable drafting machine. Operation of the instrument leaves one hand free for drawing.

A small thumb button permits user to change direction and roll the instrument quickly and easily to desired position. Smith Drake Corp., Dept. ST, 1206 S. La Brea Ave., Inglewood, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Dual Purpose Cut-Off

. . . uses blade or abrasive wheel

Utilizing a 12-inch abrasive wheel for cutting ferrous metals and a 12-inch steel saw blade for

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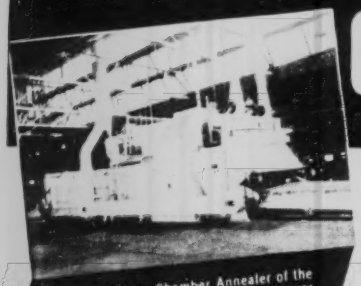
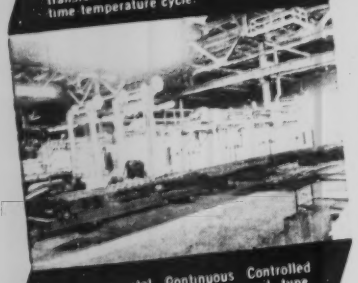
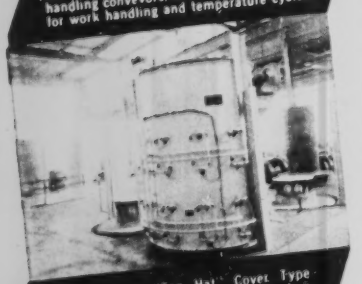


Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close tolerance control for time temperature cycle.



Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.

Continental Stamping Annealer, continuous roller rail type, complete with baskets, handling convevors, and automatic controls for work handling and temperature cycles.



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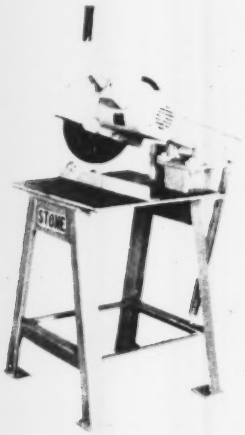
cutting nonferrous metals, this machine is equipped with a full 3½-hp geared-in-head motor. Cutting capacity in ferrous is 1½-inch



solids, 2½-inch OD pipe and 2½-inch structurals.

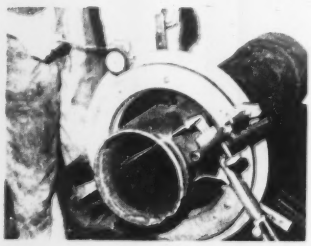
Capacity in nonferrous is 2½-inch solids and 3-inch tubing and extrusions. Stone Machinery Co. Inc., Dept. ST, 625 Fayette St., Manlius, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Torch Cuts, Bevels Pipe

. . . two minutes for 10-inch pipe

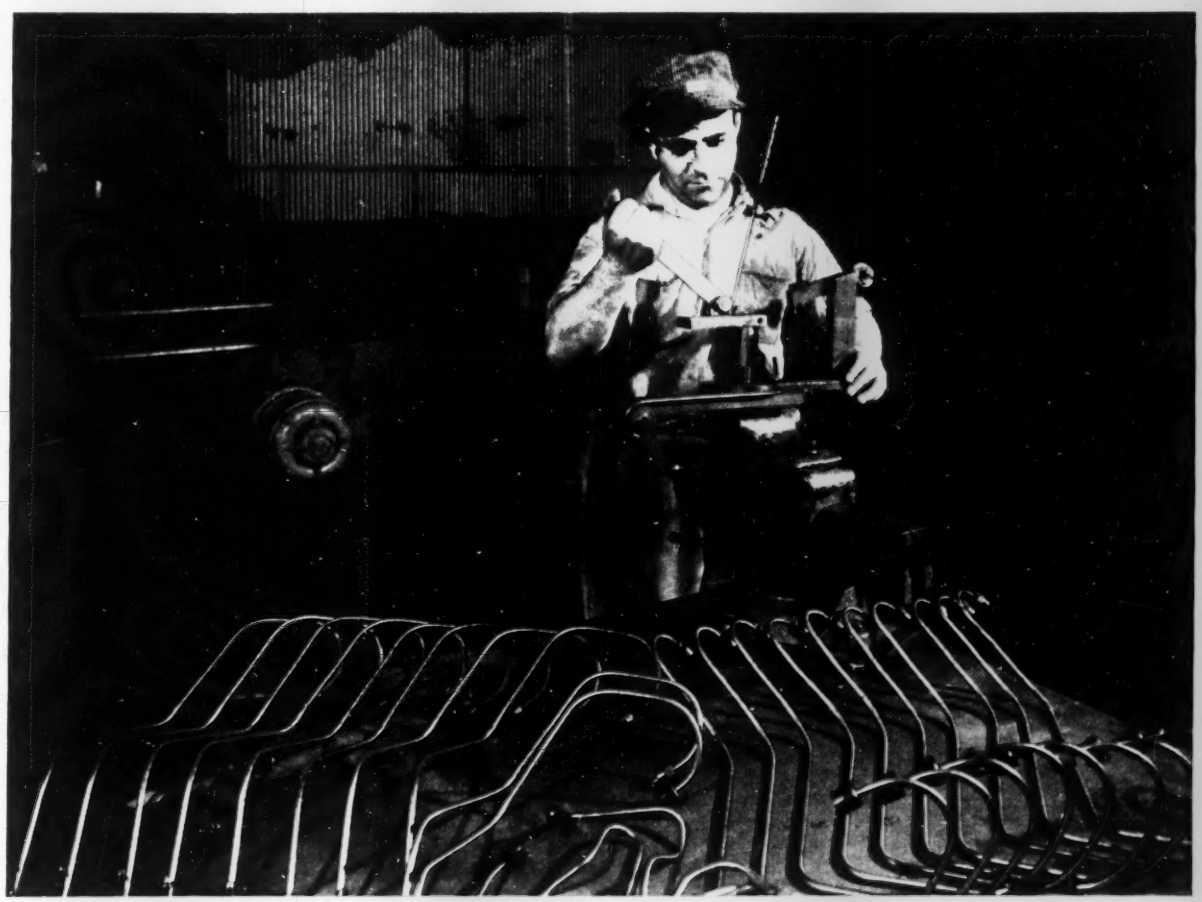
This acetylene torch cutter has a traveling carriage attachment and clamp which holds torch in a fixed position in relation to the pipe as



it rotates. It is so mounted on a precision universal chuck that it holds within 1/64-inch of accuracy.

A one-man tool, it will cut 10-inch pipe in approximately 2 minutes, with even cut and bevel all around the pipe. Two size ranges are available, 2 to 12 inches, and 10 to 20 inches. Springload Mfg. Corp., Dept. ST, 2412 Aurura, Seattle, Wash.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20



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"Miking" specialty tubing. Summerill Seamless Tubing is quality controlled from raw material to finished product.

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CALENDAR
OF MEETINGS

November 2-3, Magnesium Association: Annual meeting. Biltmore hotel, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: Martha I. Hansen.

November 2-4, Society of Automotive Engineers: National transportation meeting. Hotel Conrad Hilton, Chicago. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 2-6, American Institute of Electrical Engineers: Fall general meeting. Hotel Muehlebach, Kansas City, Mo. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

November 2-6, National Association of Manufacturers: Institute on industrial relations. The Greenbrier, White Sulphur Springs, W. Va. Association address: 14 W. 49th St., New York 20. Information: Sybyl S. Patterson, Director, Employee Relations Division, National Association of Manufacturers.

November 3-4, Society of Automotive Engineers: National diesel engine meeting. Hotel Conrad Hilton, Chicago. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 4-6, American Society for Personnel Administration: Annual meeting. Chase-Park Plaza hotel, St. Louis. Society address: Box 1443, Milwaukee. Treasurer: Bud Bitter.

November 4-6, Steel Founders' Society of America: Annual T & O Conference. Hotel Cartet, Cleveland. Society address: 920 Midland Bldg., Cleveland 15. Secretary: P. Kermit Donaldson.

November 4-6, Annual Mechanite Research Meeting: Hotel Cleveland, Cleveland. Information: C. R. Austin, Mechanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

November 5-6, Annual Pittsburgh Diffraction Conference: Mellon Institute of Industrial Research, Pittsburgh. Information: Dr. H. R. Leiner, Mellon Institute, Pittsburgh 13.

November 5-6, Steel Products Warehouse Association Inc.: Annual meeting. Statler hotel, Washington. Executive secretary: James L. Dougherty, 725 15th St., NW, Washington.

November 5-6, Society of Automotive Engineers: National fuels and lubricants meeting. Hotel Conrad Hilton, Chicago. Society address: 29 W. 39th St., New York 18.

November 6, American Iron & Steel Institute: San Francisco regional technical meeting. Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

November 9-12, American Petroleum Institute: Annual meeting. Hotels Conrad Hilton and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20. Secretary: Lacey Walker.

November 9-12, The Wire Association: Annual convention. La Salle hotel, Chicago. Association address: 63 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 9-12, Refrigeration Equipment Manufacturers Association: Refrigeration & air conditioning exposition. Public auditorium, Cleveland. Information: Banner & Greif, 18 E. 41st St., New York 17.

November 9-13, National Electrical Manufacturers Association: Annual meeting. Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

November 9-13, Montreal Chapter, American Material Handling Society and Foremen's Club of Montreal: Combined materials handling and tool and equipment show. Show Mart Bldg., Berri Square, Montreal. Information: E. M. Wilcox, Ltd., 1586 Sherbrooke St. W., Montreal, Quebec.

November 12-13, Porcelain Enamel Institute and Building Research Advisory Board: Conference on porcelain enamel in the building industry. National Academy of Sciences, Washington. Information: Building Research Advisory Board, National Research Council, 2101 Constitution Ave., NW, Washington 25.

November 12-13, Industry-College Conference: The Greenbrier, White Sulphur Springs, W. Va. Information: Industry-College Conference, 420 Chrysler Bldg., New York 17.

November 13-18, National Association of Waste Material Dealers Inc.: Fall meeting. Hollywood Beach hotel, Hollywood-by-the-Sea, Fla. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

November 15-18, Scientific Apparatus Makers Association: Fall meeting. The Cloister, Sea Island, Ga. Association address: 20 N. Wacker Dr., Chicago 6. Executive vice president: Kenneth Andersen.

November 16-17, American Zinc Institute Inc., Galvanizers Committee: Fall meeting. Netherland Plaza hotel, Cincinnati. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Geul.

November 16-18, National Association of Corrosion Engineers: Short course on cathodic protection. University of California, Los Angeles. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

November 17, Armour Research Foundation, Illinois Institute of Technology; and Trade Association Executives Forum of Chicago: Trade association technical conference. Technology Center, Chicago. Information: Illinois Institute of Technology, 35 W. 33rd St., Chicago 16.

November 17-19, Pittsburgh Business Show: Hotel William Penn, Pittsburgh. Information: R. J. Pontius, Steel City Electric Co., 1297 Columbus Ave., Pittsburgh 23.

November 18-19, National Metal Trades Association: Fall meeting. Hotel Statler, Cleveland. Association address: 122 S. Michigan Ave., Chicago 3. Commissioner: Charles L. Hatchford.

November 18-20, American Institute of Electrical Engineers: Joint AIEE-IRE conference on electronic instrumentation in nucleonics and medicine. Hotel New Yorker, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

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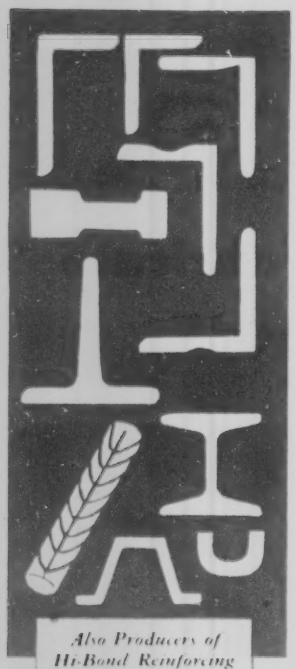

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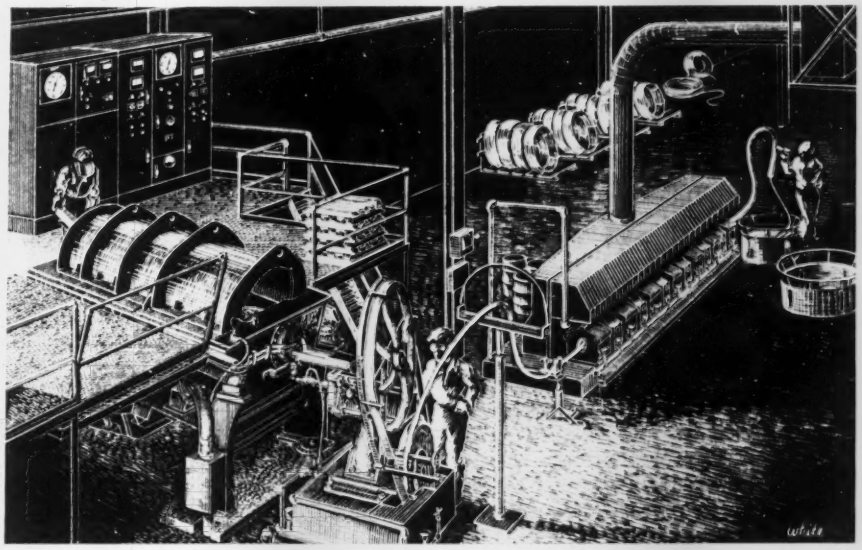

Rome Cable Corporation

uses AJAX INDUCTION FURNACES for

MELTING ALUMINUM FOR CONTINUOUS CASTING AND ROLLING OF HIGH CONDUCTIVITY ROD

The picture above, a drawing made at the Rome Cable Corporation, Rome, N. Y., shows one of the most modern installations in the country for the continuous casting and rolling of aluminum rod directly from molten metal. From left to right are shown the electric controls of the adjacent 450 kW. AJAX low frequency induction combined melting and holding furnace which is pouring molten metal into the Properzi continuous casting machine in the foreground, and the rolling mill from which the coiled rod is emerging.

This installation casts at the rate of about one ton per hour. The furnace feeds a continuous stream of molten aluminum at automatically controlled temperature into a rim cavity on the slowly revolving wheel of the Properzi machine. Metal loss from pig to rod averages less than 1 pct. Mechanical properties and electrical conductivity are excellent; the material is sound and fine grained. The men work under cooler, cleaner conditions because the only heat generated is within the melt itself. Due to melting conditions inherent in AJAX furnaces, the operation is continuous and no fluxing is required.

AJAX TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N.J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
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AJAX ELECTRIC CO., INC.,
AJAX ELECTRIC FURNACE CORP.,

Cold Extrusion Saves Metal, Time . . .

Slug weighing 1.6 pounds does job that requires 3-pound slug in hot forging process. Automatic, screw-cutting machine does all machining necessary in one operation

MORTAR SHELLS are being squeezed from slugs of carbon steel by a cold extrusion process at the Oliver Corp. plant in Springfield, O. Tooling for full-scale production took about 11 months.

According to Ernest Olsen, methods superintendent at the plant, development of the process by Oliver came about in this way:

"We heard of a process brought over from Germany after World War II. On the basis of that, we went to Frankfort Arsenal at Philadelphia to get further information. With the knowledge we gained there, plus what we gathered from phosphate coating suppliers, we arrived at the sequence now used."

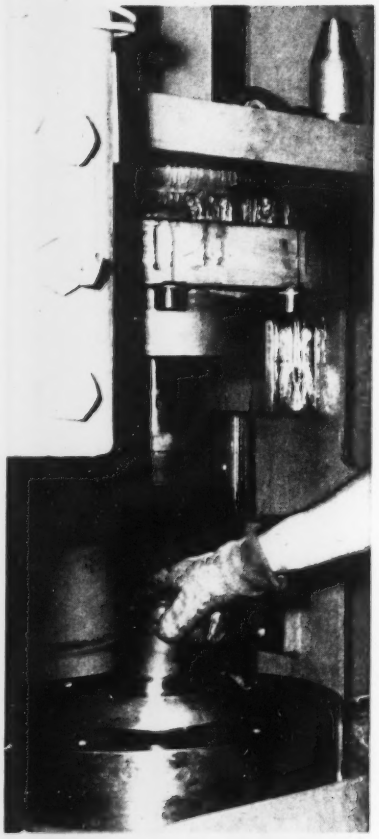
Sequence—Starting point is a metal slug, which is cut from low-carbon, bar steel stock 2½ inches in diameter. Slug is 1 3/16 inches thick and weighs 1.6 pounds. Latter is kept at a close tolerance by spot-check weighing.

After phosphate coating (to prevent adhesion to the die) and lubricating, slug goes to an 800-ton press, where it is given its first forming. Then it goes through four other presses, each of which is equipped with dies to successively form the shell closer to its finished shape. Pressures run to 150 tons psi.

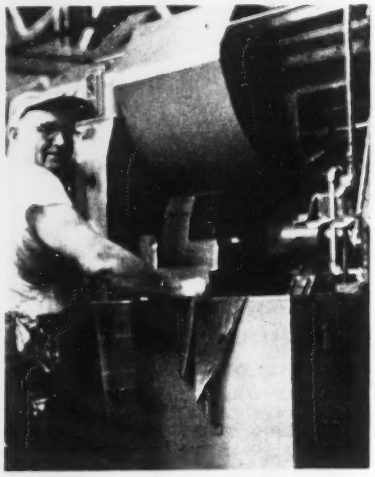
To improve physicals, shells undergo two annealings and one stress relieving operation. After final forming, shell goes to an automatic, screw-cutting machine, which does all machining in one operation. Last steps include fitting an adapter to the shell, spray painting and packaging.

Dollars and Cents—Olsen sees the process as a time and metal saver. "In the instance of the mortar shell, some producers are using hot forgings weighing 3 pounds, while the slug used in cold extrusion weighs 1.6 pounds," he said, adding:

"There is a further advantage with this item. One is able to start with a slug about the final diameter of the finished piece and can end up with a cup having a thick bottom with respect to its sides. This is done with fewer operations than used in drawing."



Slug takes shape at third extrusion station. Steps include two annealings and one stress relieving operation



Automatic screw machine carries out all machining steps in one operation for a saving of 75 per cent in time

Evolution of a mortar shell from a slug of low carbon steel on extreme right to finished product shown left

Aluminum Electrodeposits Made Adherent

Metal to be plated with aluminum is dipped in fatty acid solution to give strong bond with base. Parts can be twisted and bent to rupture without plate coming loose

By W. C. SCHIRCKNER
Battelle Memorial Institute
Columbus, Ohio

TWO METHODS for electrodepositing aluminum from nonaqueous organic baths have recently been developed. Both produce thick aluminum plates with good properties and appearance.

Aluminum plating bath developed at National Bureau of Standards consists of an ethereal solution of aluminum choride to which lithium or lithium-aluminum hydride is added. The aluminum deposits are ductile and deposition rates of 0.001 to 0.002 inch per hour are possible. Plates 0.02 to 0.035-inch thick are produced, with Vickers hardness which ranges from 37 to 97.

Bureau of Standards reports that baths of this type are easy to prepare, give off no corrosive fumes and are not highly sensitive to moisture, although bath life is longer if the solutions are protected from air.

Composition—Optimum concentration of aluminum chloride in the bath is in the range 265 to 400 g/l. Hydride is added as lithium hydride in concentrations of 4 to 8 g/l or a lithium-aluminum hydride. Satisfactory solvent is ethyl ether. Bath is operated at room temperature with current densities up to 50 amp per square foot. Anode and cathode efficiencies are about 100 per cent.

Another aluminum plating process developed at Battelle Memorial Institute is used for electroforming aluminum wave guides. Bath consists of a dispersion of toluene in a toluene solution of the fusion product of ethyl pyridinium bromide and aluminum chloride with methyl t-butyl ether or another addition agent for improving the physical properties of the aluminum electrodeposits.

Wave guides are electroformed in the Battelle process by electrodepositing aluminum on electropolished, copper-plated, cadmium-nickel alloy mandrels, followed by melting out the cadmium-nickel alloy and dissolving out the copper in nitric acid solution. This is a new procedure for getting mirror-like inner surfaces of electroformed articles. Aluminum walls are dense, strong and ductile.

Difficulty—Neither of these aluminum plating processes gives adherent aluminum deposits on commonly used basis metals. Battelle researchers looked into this problem and have recently come up with a simple treatment whereby good adherence of the aluminum plate can now be obtained from the aluminum chloride-lithium hydride-ethyl ether type of bath.

Metal to be plated with aluminum is activated as for aqueous electroplating, dipped in alcohol to displace water, and finally in fatty acid or fatty acid solution in ethyl ether. The piece is then immersed in the aluminum-plating bath, current preferably being applied after immersion.

Acid Dip—Lauric, oleic and linoleic fatty acids can be used successfully; pelargonic acid is unsatisfactory probably establishing a lower limit to the carbon-chain length necessary in the fatty acid used. Copper, iron, nickel, stainless steel, and aluminum sheet have been used in the process, each bonding well to the aluminum electrodeposit.

Aluminum waveguide segments produced by electroforming. From left to right they are: Flanged straight segment; tapered segment; and one with 90-degree bend and 90-degree twist

Bond between the aluminum and basis metal is strong. Plated specimens can be twisted and bent to rupture without the plates coming loose. Striking a heavily plated edge with a coarse file may fold a very narrow edge of plate, but such an edge cannot be further peeled using a knife blade.

Mechanism by which the fatty acid treatment promotes adhesion is believed to be related to the wetting and orienting properties of the fatty acids. These improve the wettability of the base metal by the plating solution and perhaps produce preferred orientation of solvent complexes with respect to the base metal.

Work Performed under AEC Contract No. [illegible]

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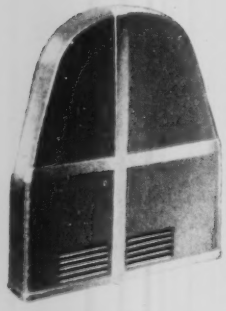
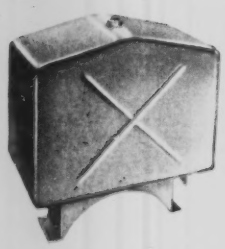
1. Safranek, W. H., Schickner, W. C., and Faust, C. L., J. Electrochem. Soc., 99, 53 (1952).
2. Brenner and Couch, J. Electrochem. Soc. 99, 23R (1952).

SHEET METAL FABRICATION

by KIRK AND BLUM





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KIRK AND BLUM
METAL FABRICATION

Plastic Truck Bodies

Rugged tests in West Coast trade prove highly practical. First cost is high; savings follow

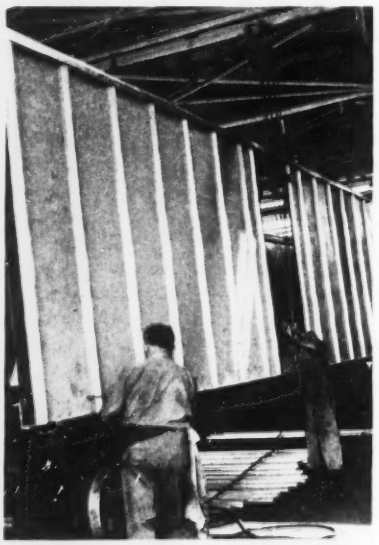
NEW DEVELOPMENT in the rapidly expanding use of plastics in motor vehicle manufacture is announced by Seaboard Transportation Co., Antioch, Calif. It is the production of truck and trailer bodies constructed of Vibrin polyester resin, made by Naugatuck chemical division of U. S. Rubber Co., and glass fiber.

To date, the largest plastic trailer bodies built by Seaboard are 24 x 8 feet wide and 8 feet high. This particular size is the one most commonly used by the company.

All Weather—Units are used in "trains," consisting of a tractor and two semi-trailer combinations, with a gross over-all weight of 76,800 pounds, maximum permissible in coast states.

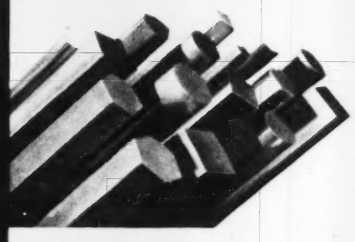
The equipment is subjected to extremely heavy usage in all types of weather conditions and temperatures, from the desert areas in California to the snow and ice covered mountains of the northwest.

Simple Construction—Construction of the plastic trailer bodies is not complicated. Material is molded in wood, steel and plastic molds by "laying-up" the fiber



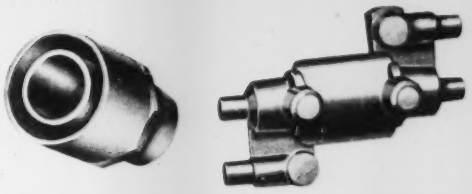
Side of reinforced plastic trailer is set into place on a chassis on the assembly line. Fiberglass and Vibrin resin makes up side panels

Brass and Bronze Free-Cutting Rods



Furnished in all sizes from 1/16" for small-diameter rods up to 10" for cast and turned rounds. The most easily-machined of all metals and alloys.

Brass and Bronze Forgings



From 1/4 oz. to 100 lbs. in weight. Produced to meet requirements of uniform dimensions, finish and physical properties.

Extruded Brass Shapes

Squares, hexagons, half rounds, half ovals, and special shapes. Extruded only rectangles furnished up to 5½" maximum diagonal. Extruded, drawn, machine-straightened hexagons up to 4", rectangles up to 3½" maximum diagonal.

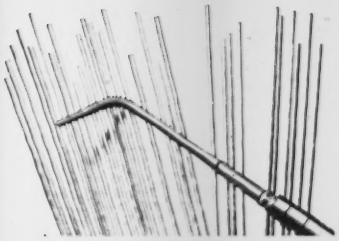
Brass Pressure Die Castings

Parts having thin sections and intricate cored parts readily produced. Titan die castings have better finish, stronger structure and greater accuracy than sand castings.

Titan Brass and Bronze Products

Titan brass and bronze products are supplied in analyses to meet every requirement. Write for descriptive catalogs.

Bronze Welding Rods



Eight different types meet all requirements. Titan's exclusive Double Deoxidation process assures ductile, high-strength, non-porous welds with the oxyacetylene torch.

Brass Cold Heading Wire

Brass wire for manufacture of rivets, bolts, screws, fasteners, etc.

Titan

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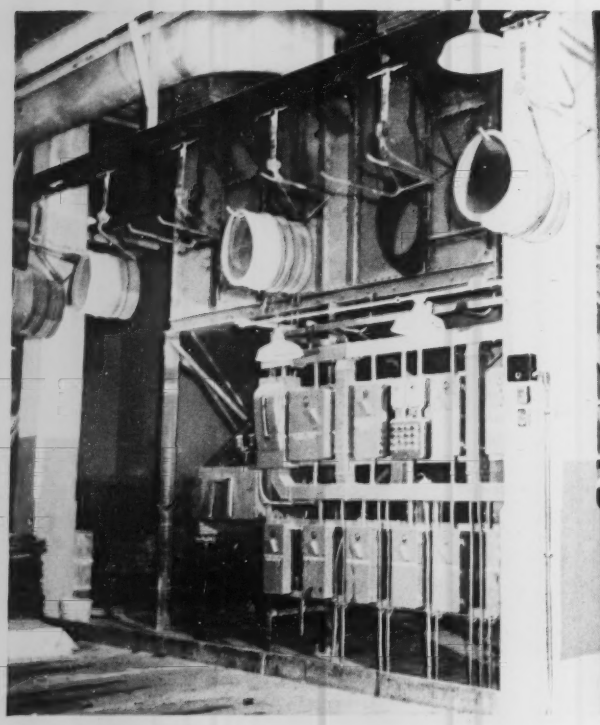

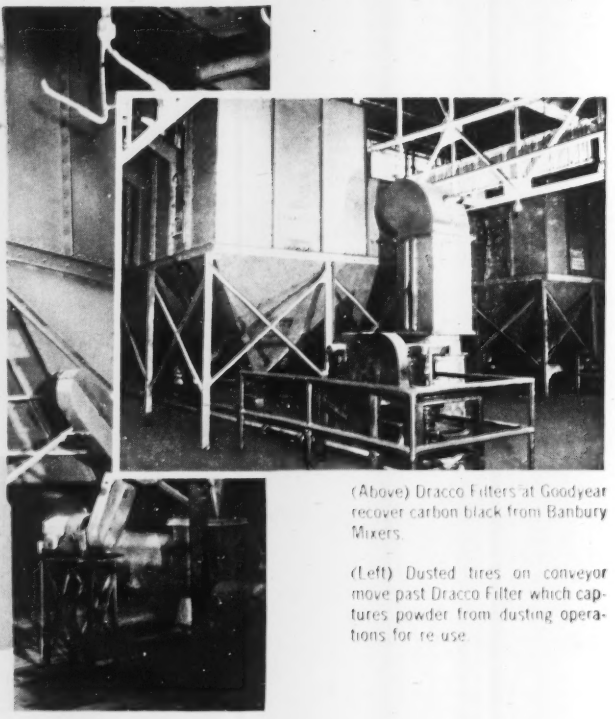

(Above) Dracco Filters at Goodyear recover carbon black from Banbury Mixers.

(Left) Dusted tires on conveyor move past Dracco Filter which captures powder from dusting operations for re-use.

IT TOOK MORE THAN EQUIPMENT TO SOLVE GOODYEAR'S DUST PROBLEMS!

● Two special Dracco Dust Control systems were recently incorporated into existing processes at The Goodyear Tire and Rubber Co. in Akron, Ohio.

One system collects carbon black from Banbury Mixers; the other traps powder used for dusting uncured tires. In both systems Dracco's design provides for re-use of all collected materials by automatically returning them to process.

Even with superior Dracco Dust Control Equipment in these systems it took an extra something to assure highly efficient, integrated dust control. This was Dracco's *application engineering* which resulted in custom-designed installations exactly meeting Goodyear process requirements. This precise engineering was the key factor in turning Goodyear's dust problems into dust profits.

For greater industrial efficiency, control your plant dust. For greater dust control efficiency, remember Dracco—the Name, the System, the Engineering Skill.

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Dracco Bulletin 800 presents valuable information on "Industrial Dust Control and Recovery". Write today for your copy.

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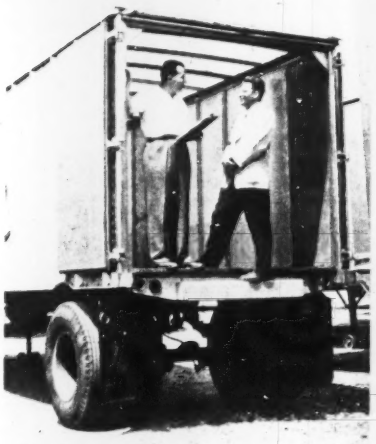

Roof of this 32-foot truck trailer is made from panels of reinforced plastic

glass cloth and mat, cut to rigid specifications, following which it is saturated with Vibrin polyester resin.

As the process proceeds, preformed ribs, made of the same material, are pressed into the wet lay-up ultimately forming a complete section, the parts of which, when cured, are one integral unit.

Since it is corrosion resistant, as well as strong and light, the plastic is also used for complete sides and roofs of a number of van-type trailers. These are used to haul corrosive materials, such as commercial chemicals. Service reports indicate the trailers will have considerably longer life than those previously used for corrosive materials, Strick says.

Vacuum Method — Doors are molded by a vacuum impregnating method, in which the plastic resin is sucked up into the mold cavity in which the fibrous glass has been previously placed. Side panels (four by eight feet), roofs and interior liners are made in a large press.

Roof panels are less than 1/16-inch thick. Side panels are 3/32-inch, except for a three-foot band at the bottom which is built up to ¼-inch for added strength.

In the assembly of the trailers the side panels are riveted to exterior aluminum posts and, together with a top and bottom aluminum rail, form the load-carrying members of the trailer. Riveted construction is also used for roof panels in completely plastic roofs and in the skylight roofs.

The cost man figures they're money-makers!

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Forged, machined, ground, formed and welded products indicate eventual usefulness of titanium commercially

Surface Treatment of Titanium

Researchers produce hard surfaces with purified nitrogen and nitrogen gas, gas carburizing and induction heating. Silicon coating affords protection against oxidation

IMPROVING surface properties of titanium and its alloys is one of the big challenges facing research men today. Some progress can be reported, but, of course, much work remains to be done.

At this stage, a few generalizations are possible. Concerning surface hardening, it is apparent: 1. Results obtained from treatment of unalloyed titanium and several of its alloys in a purified nitrogen atmosphere are promising. 2. Nitriding with nitrogen gas appears to be more effective than dissociated ammonia. 3. Cases formed by gas carburizing, using propane-argon mixtures, seem to have good wear properties and 4. Induction heat treating will produce a relatively hard case with a ductile core.

Under the subject of general surface treatment, research now indicates: 1. Siliconized coatings afford oxidation protection for titanium and its alloys in normally corrosive atmospheres. 2. Although further work is necessary, there are indications that a simultaneous pickling and plating process may afford one of the better methods of electroplating titanium. 3. Vapor deposited coatings of molybdenum on RC-55 sheet are ductile when produced under certain conditions and 4. Excellent anti-galling properties can be obtained by anodic or chemical immersion treatments, plus use of supplemental lubricant.

Temperature Critical—Hardening is evident at 1400° F and above when a purified nitrogen atmosphere is used. Up to a point, hardness and depth of penetration, as determined by hardness traverses, increase with time and temperature. However, time ceases to have a significant effect upon depth of penetration after 16 hours. Brittleness increases at 1800° F and above.

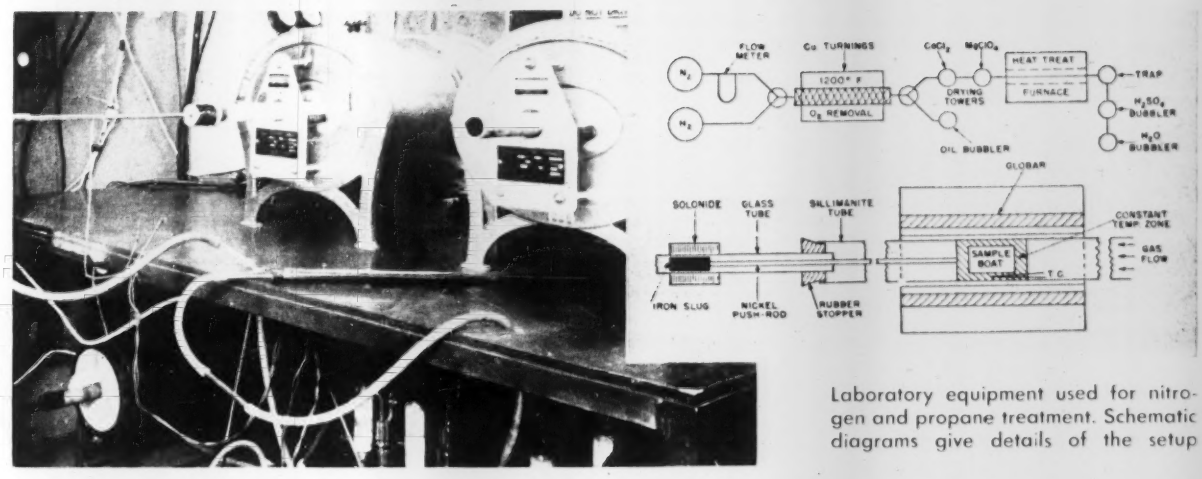
Specimens of unalloyed titanium and several of its commercial alloys appear to have promising surface characteristics when treated at 1600° F for 16 hours. Surface hardness ranges between 800-1000 VHN. Maximum case depth is 0.0035 inch

Titanium-base, binary alloys treated in purified nitrogen show the surface hardening qualities of unalloyed titanium. Titanium-base vanadium and boron alloys seem to have the most significant effect on final surface hardness. For some unexplained reason, hardening is apparent after treatment at 1200° F and above.

At 1600° F and below, nitrogen content rather than grain size has a more pronounced effect on reducing impact energy of treated material. After treatment at 1600° F in nitrogen, impact energy of Ti-75A at room temperature was reduced from an as-received value of 17 foot pounds to 8 foot pounds. Heating at 1000° F for 16 hours in helium raised room temperature impact energy to about 50 foot pounds.

Nitrogen Gas—Use of nitrogen gas, as in the case of a purified nitrogen atmosphere, generally shows highest hardness in treatment at 1600° F for 16 hours. Longer heating produces little change, and, in fact, may decrease hardness. Practical results have not been obtained below 1400° F. By this method, DPH surface hardness in the order of 1000 to 1200 (100 gm) has been obtained with Ti-75A, RC-130A, RC-130B and Ti-150A.

In addition to being superior to dissociated ammonia in hardening, nitrogen gas also seems to contribute more to case depth. Its



Laboratory equipment used for nitrogen and propane treatment. Schematic diagrams give details of the setup

case depths are about 0.0015 inch, and preliminary x-ray diffraction studies indicate presence of TiN in nitrogen tested samples. Dissociated ammonia produces little TiN.

Tensile tests show Ti-75A has the least loss in physical properties when treated in nitrogen gas. This material, as well as other titanium alloys, is extremely brittle after treatment in dissociated ammonia.

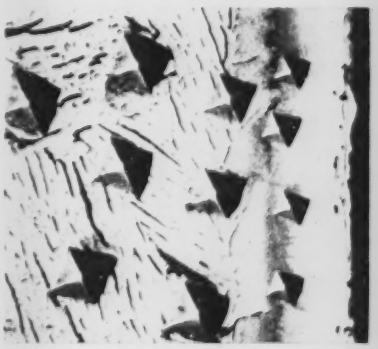
Carbo-nitriding—Propane gas is cracked in a nickel retort at 2100° F. With a gas-air ratio of 1:8, gas analysis indicates absence of CO_2 and O_2 and 22 per cent CO. Cracked gas is mixed with ammonia and raw propane, then fed into a carbo-nitriding furnace. Gas mixture is 33 per cent ammonia, 2 per cent raw propane, and the balance is cracked propane.

Run at 1500° F for 30 minutes produced specimens with dark discoloration and slightly roughened surfaces. Surface hardness values were DPH 824 (100 gm) for Ti-75A and DPH 743 (100 gm) for Ti-150A.

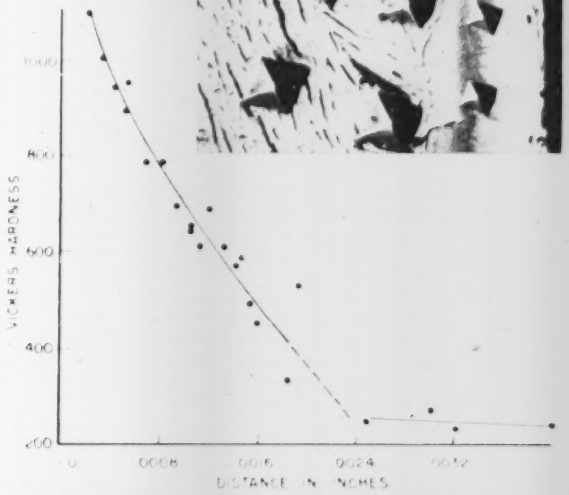
Carburizing—Cases formed by gas carburizing titanium, using a propane-argon mixture, seem to have best wear characteristics of any of the hard surfaces produced to date. Optimum conditions seem to be: Six to eight hours at 1750 to 1800° F in an argon ½ per cent propane mixture (by volume). Cooling is in argon.

Case is about 0.0001 to 0.0002 inch deep, with hardness of about 1500 Knoop. Structure is of TiC type. Despite extreme shallowness, cases have proved superior in wear resistance when compared to deeper cases formed by pack or liquid carburizing. Chief drawback is that deeper cases can't be produced without spalling or poor surfaces. In laboratory wear tests, TiC cases performed satisfactorily under loads up to 2200 psi.

Induction Heat—Induction coil with an eddy-current concentrator



Indentations highlight hardness of surface layer and core of Ti-75 specimen treated in purified nitrogen at heat of 1800° F for 16 hours. Curve shows Vickers hardness vs distance below surface. Sample was in 1600° F purified nitrogen 16 hours



Comparison of Ammonia and Nitrogen Gas Treatments

	As-received	NH_3–1600° F 16 hours	N_2–1600° F 3 hrs
(1) Ti-75A			
Ultimate strength	85,000	68,000	80,000
Yield strength (.2% offset)	67,000	58,000	51,000
% elongation in 2"	15.0	1.0	16.5
(2) Ti-130A			
Ultimate strength	145,000	122,000	141,000
Yield strength (.2% offset)	126,000		123,000
% elongation in 2"	15.0		4.0

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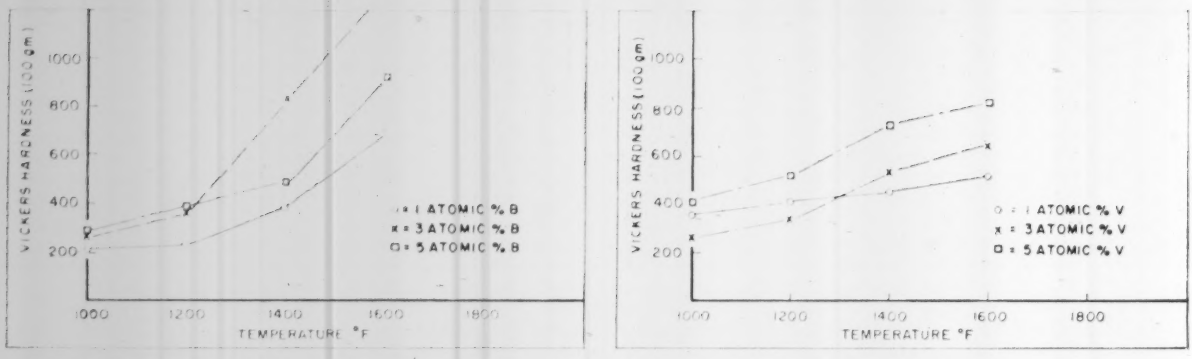

Comparative Vickers hardness numbers of boron alloys (top) and vanadium alloys (bottom). They were treated for 16 hours in nitrogen atmosphere

operated at frequencies of 200 to 500 kc, produced case depth of 0.040 inch. Specimens were ½-inch, round bars of RC-130A. Case and core hardnesses of 535 and 330 VHN, respectively, were obtained by aging after induction heat treating. RC-130B and Ti-150A were hardened to a much smaller degree by the treatment.

Hard surfaces produced on titanium alloys by heat treatment seem to gall as readily as surfaces of annealed, unalloyed metal, but induction-hardened alloys may be useful for structural applications calling for hard, high-strength case and a more ductile core.

Siliconized Coatings — These coatings extend protection of titanium and its alloys in air by the factor of 20 or more up to 1832° F. Tests indicate protection for more than 2000 hours in air at 1472° F. Life of uncoated material under these conditions is about 100 hours. Molybdenum silicide, for example, has excellent corrosion resistance.

Silicon powder, plus an organic binding substance suspended in a low-boiling point liquid, is applied by brushing, dipping or spraying. After liquid is volatilized, specimen is heated in an inert atmosphere or vacuum first at low temperatures to remove binder, then near melting point of silicon.

Normal coat, about 2 mils thick, has a dull metallic luster and is well bonded. It is composed of two or more rather sharply defined layers of titanium silicides.

Electroplating—Some satisfactory metal-to-metal bonds have been obtained using a simultaneous pickling and plating process. Solution includes ethylene glycol, hydrofluoric acid, small amounts of water and traces of zinc or other metal ions.

Difficulty has been that results are not uniform. Baths of different composition, including low-melting, fused salts, are being studied with an eye toward simultaneous oxide removal and metal covering.

Moly Coating—This metal has been vapor deposited on RC-55 sheet, with results varying with treatments. Optimum conditions seem to be: Treatment at 1700° F, under pressure of 0.5 mm mercury. Specimen coated with 0.0001 inch molybdenum had DPH hardness of 800 (100 gm) and was ductile. It withstood a 180-degree bend over ¼-inch radius without failure. Distinct diffusion occurred, and, metallographically, it appeared that a solid solution of molybdenum in titanium had been effected.

Duplex process to combine higher hardness with ductility has not been successful. It entailed: Flash deposition at 1700° F for 2 or 3 minutes, followed by 1000° F deposition. Plate cracked after 5 to 10 degree bend over ¼-inch radius, but cracks did not propagate into titanium. Preliminary evidence indicates cracking stopped at boundary of high and low temperature molybdenum deposits.

Chemical Treatment — Best anodic treatment to date is the 5 per cent NaOH bath. Two promising chemical coating baths are: (1) 50 g l $Na_2Po_4.12\ H_2O$, 20 g l KF, 15 ml l HF and (2) 30 g l $Na_2C_2O_4$, 20 g l KF, 1 ml l HF.

Control of pH of solution No. 1 is important. Coating also is affected by bath temperatures, immersion time and, to an extent, by alloy composition. For example, Ti-75A and RC-130B coat under some conditions, while RC-55 needs a slightly higher pH.

Marked improvement of wear properties was obtained by heating phosphated titanium in air at 800° F for 1 hour.

Wire (⅜ by 1/16 inch) with phosphate coating and companion lubricant has been drawn up to 7 passes at 10 to 15 per cent reduction per pass. Grades included 75A, 100A, 150A, 175A, RC-130A and RC-130B. Companion lubricants used with success included Molykote G, Houghton 3105 and Dri-Draw.

Machinability—Phosphate, oxalate and 10 per cent NaOH coatings have shown good wear and seizure properties. They ran 500 strokes on a shaper machine. Using a machine designed to test lathe bed materials, best results were obtained with a heat-treated, phosphate titanium button, which ran against a 1045 steel wear plate. Specimen ran 90,000 strokes under a load of 1250 psi before galling.

Heat-treated, phosphate titanium button running against a heat-treated, phosphate titanium wear plate lasted 7000 strokes before both wore through. Other combinations wore through and galled in 9 to 20 strokes.

Summary of recent symposium held at Armour Research Foundation, Chicago, under sponsorship of Watertown Arsenal, Watertown, Mass. Technical chairman was M. M. Jacobson of Watertown.

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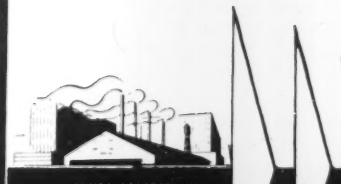

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NBS-AEC Cryogenic Lab

New facility in Colorado will unfold data on liquefied gases and their effect on materials

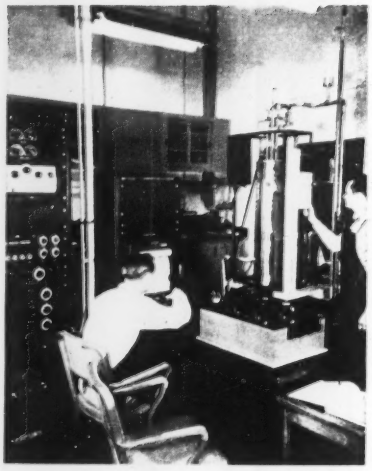
A MAJOR LOW-TEMPERATURE engineering facility, consisting of a liquid-hydrogen plant and a cryogenic laboratory, has been placed in operation at the National Bureau of Standards site at Boulder, Colo. Known as the NBS-AEC Cryogenic Engineering Laboratory, the new $3,500,000 installation makes possible large-scale production of liquefied gases which have not previously been available in sufficient quantity for laboratory and industrial development and testing.

Initiated by Dr. F. G. Brickwedde, chief of the NBS heat and power laboratories, the cryogenic lab was designed under his direction, in co-operation with the Atomic Energy Commission, to provide facilities needed for the development and evaluation of cryogenic equipment for use at temperatures near absolute zero.

Well Underway — Low-temperature activities at Boulder are carried on by a staff of 60 NBS personnel, under the supervision of R. B. Scott. Besides the production of liquid hydrogen and liquid nitrogen in unusually large quantities, a program of research and development, directed chiefly toward the improvement of low-temperature equipment, is well under way.

Liquefied gases—oxygen, hydrogen, and nitrogen—are finding increased application in industry and national defense, making necessary larger, more convenient, and less hazardous equipment for producing and handling these liquids. As a result, many new and highly complex engineering problems have arisen in the low-temperature field, where much remains to be learned about the behavior of engineering materials.

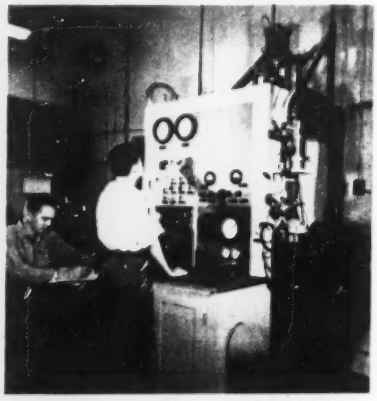
Metals Change—At liquid-hydrogen temperatures, normally trustworthy construction steels become brittle, rubbers lose their elasticity, and the mechanical properties of plastics are greatly altered. In general, there are such marked differences between the behavior of matter at ordinary and very low temperatures that the low-temperature properties cannot be obtained by extrapolation.



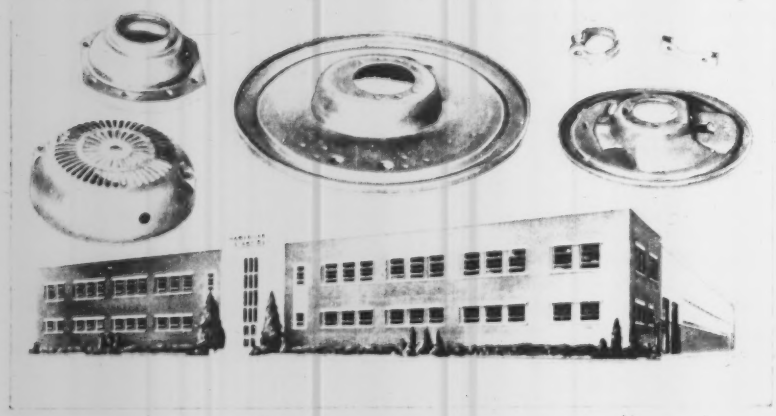
This apparatus determines heat conducting properties of metals and plastics at low temperature. Electrical heat is applied to the specimen kept at low temperature in cryostat, right

The NBS-AEC Cryogenic Engineering Laboratory is investigating structural and other engineering properties of matter at low temperatures to provide the needed data and is developing more satisfactory materials and equipment for low-temperature use.

Three Units—The Boulder installation is located on a 210-acre tract, the site also of the Bureau's large radio propagation laboratory now under construction. It consists of three principal units: a liquid hydrogen plant, a liquid nitrogen plant, and a group of labo-



Tensile properties are checked in this machine. Stress, strain and temperature readings are obtained from test sample located behind the panel



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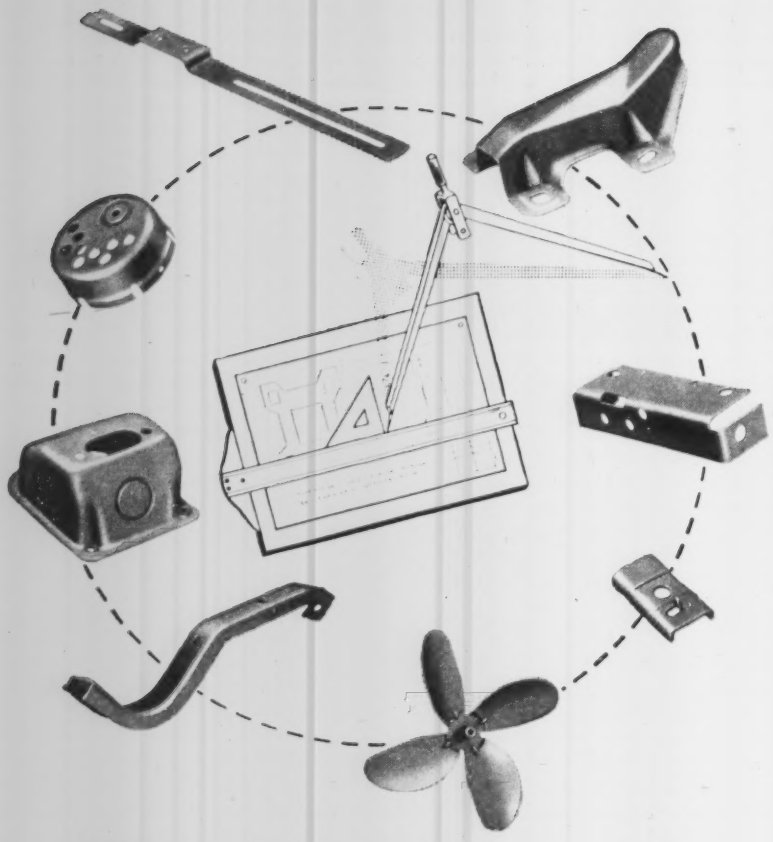

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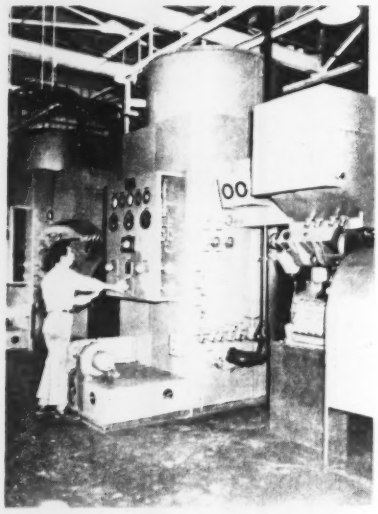

Two complete liquid nitrogen generators first liquefy air and then remove liquid oxygen by distillation

ratories for research and development.

Both major buildings are equipped with many safety and anti-explosion devices to minimize the hazards of working with liquid hydrogen in large quantities.

Putting It To Use — Research and development at the NBS-AEC Cryogenic Engineering Laboratory are directed principally toward safer and more convenient means for handling liquid hydrogen and toward increased knowledge of the properties of materials at very low temperatures. Efficient design of low-temperature equipment requires information on the mechanical and heat-conducting properties of many metals, alloys, and plastics over a temperature range extending from room temperature down almost to absolute zero.

The Bureau is now developing apparatus for low-temperature measurement of the tensile and impact behavior and fatigue properties of these materials. Such data are at present very meager and are mainly confined to those materials and temperatures encountered in aircraft design. As a first step toward the accumulation of thermal conductivity data, apparatus has been designed which provides results in the temperature range from 2° to 300° K. The new apparatus is expected to make possible more rapid collection of data without loss of accuracy.

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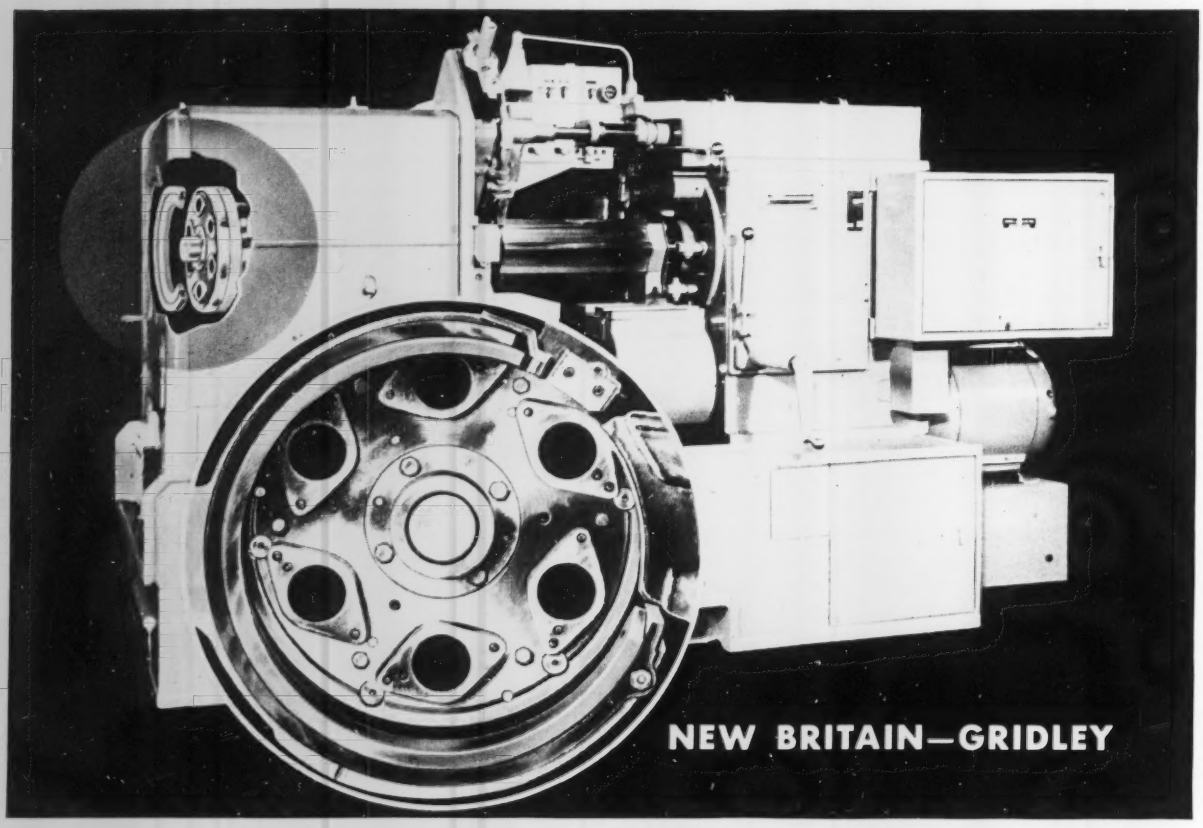

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This New Britain-Gridley six-spindle automatic screw machine is built to assure continuous production on the toughest jobs without the necessity of frequent adjustment or overhauling.

The function of the stock feed guard ring (shown above) made by National Bearing Division is to keep the six stock feed tubes in proper position while bar stock is being machined and the spindle carrier is being indexed. The stock feed tubes each have a spool which rides on the guard ring. Spindle speed on some machines reaches 2750 rpm. The spindles, indexed into six positions around the circumference of the ring, require close tolerances on the guard ring so that the bearing area will remain uniform.

National Bearing Division was entrusted with the production of this vital component because of its skill in producing centrifugal castings with high physical characteristics, in addition to the economies that could be realized through the purchase of a semi-machined part. National Bearing produces tool slide bushings for these same machines centrifugally cast to the same degree of accuracy and soundness.

If your product requires copper, bronze, or other copper-base castings, it will be worthwhile for you to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

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Market Outlook

THE STEEL BUYER is beginning to know how it feels to be in the driver's seat once again, and he likes it.

Not only is he more frequently getting what he wants when he wants it and at costs more favorable than they were a few months ago, but his position continues to improve. Competition among steel producers for his business is intensifying, and as a result, freight absorption by mills is an increasing factor.

FANNING OUT— In addition to absorbing freight charges on wire and wire products, tin plate and various specialties, mills are applying the practice increasingly to bars and sheets.

Feeling the sting of competition least are the steel producers who all along charged only standard prices. Hurt the worst are producers, most of them small, who charged premium prices when steel was hard to get. One of these small producers was down to a steel ingot production rate of only 20 per cent of capacity last week. Earlier this year the mill was running at 100 per cent of capacity. Unless a sufficient amount of orders are received quickly, that mill will cease production next Friday. There are reports the mill is for sale. Another mill that had been charging premium prices cut its operating rate from 100 to 33 per cent.

THEY GAIN— This shift of buyers away from mills which had charged premium prices is helping standard price mills fill up order book slack resulting from the general easing in business and the move on the part of steel consumers to live off inventories to reduce them.

SOMETHING TO WORK FOR—This inventory reduction is being felt also among commercial steel warehouses—suppliers of steel to small consumers. To get business, some of the small warehouses are lowering prices and absorbing freight. But the situation is nothing that some strong selling won't overcome to a considerable extent. One large warehouse says, "We really have to sell now, but the business is there."

INEVITABLE— The pinch on premium price sellers was not unexpected. Everyone knew that when steel demand became a little less than supply, the premium price sellers, most of whom are high-cost or marginal firms, would feel the blow. A change of a few percentage points in demand can spell the difference between life and death of a marginal company.

ENCOURAGING— Actually, steel demand, as reflected by current production, has not dropped a lot. In the week ended Oct. 31, output of steel for ingots and castings was at 94 per cent of capacity. While that rate is down 1 point from the preceding week, a representative of one large steel company says, "We can't kick on that. In fact, we shouldn't complain if the national rate were 90." The country's largest producer of steel, U. S. Steel Corp., finds steel demand strong enough to sustain its ingot production close to capacity the rest of this year. The corporation's chairman, Benjamin F. Fairless, says he would not be much surprised if production in the first quarter of next year averaged around 95 per cent, with the industry as a whole not varying much from that figure.

PRICE TRENDS— Increasing competition in the steel market lowered STEEL's arithmetical price composite on finished steel another 23 cents, making the latest figure $115.18 per net ton.

NATIONAL STEELWORKS OPERATIONS

DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Oct. 31	Change	Same 1952	Week 1951
Pittsburgh	90	2*	106.5	103
Chicago	97.5	0.5*	112.5	109
Mid-Atlantic	93	2	99	101
Youngstown	100	4	106	106
Wheeling	95.5	2.5	98	101.5
Cleveland	105	3	110	103.5
Buffalo	106.5	0	106	104
Birmingham	96.5	0	107	90
New England	82	5	85	90
Cincinnati	68	12.5	90	103
St. Louis	96	0.5	96.5	91
Detroit	97.5	3	106	101.5
Western	101	1	106	106
Estimated National Rate	94	1	106.5	104

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,450 net tons in 1953, 2,077,010 tons in 1952, 1,906,024 tons in 1951.

The Metalworking Outlook—p. 31 The Technical Outlook—p. 89

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Oct. 27

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H. R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.013	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.286				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Oct. 27 1953	Oct. 20 1953	Month Ago	Oct. Average
(1947-1949=100)	141.5	141.5	141.7	141.5

STEEL's FINISHED STEEL PRICE INDEX

	Oct. 29 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	151.86
Index in cents per lb.	5.130	5.130	5.130	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Oct. 29 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.18	$115.41	$115.56	$110.98	$95.05
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	33.83	32.83	31.50	43.00	43.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Oct. 29 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.225	3.50
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts.	4.525	4.525	4.525	4.325	3.775

PIG IRON, Gross Ton	Oct. 29 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$36.50	$36.50	$34.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	31.50	31.50	30.50	41.50	45.25
No. 1 Heavy Melt, Chicago	33.50	30.50	29.50	42.50	41.75
No. 1 Heavy Melt, Valley	35.50	34.50	35.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	32.50	31.50	30.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	34.50	34.50	35.50	43.00	48.50
Rails, Rerolling, Chicago	43.50	42.50	49.00	52.50	66.50
No. 1 Cast, Chicago	32.50	32.50	32.50	46.00	70.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99% plus, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.40 per lb for 550 lb keg; $2.42 per lb for 100 lb case; $2.47 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.125 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis. New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Oct. 29	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.500	29.375	24.500
Lead	13.30	Sept 16	13.80	13.540	13.800	14.228
Zinc	10.00	Sept 11	10.50	10.180	11.000	13.259
Tin	$2.00	Oct. 28	$1.25	$2.410	$2.530	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99% plus, deld.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $183-$185 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4-x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots, for addition to cast iron 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz. nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16.00-$21.50 per mg. radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $42.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 82.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Price western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 20.25-21.25; No. 12 foundry alloy (No. 2 grade) 19.50-20.50; 5% silicon alloy, 0.60 Cu max., 22.25-23.00; 13 alloy, 0.60 Cu max., 22.25-23.00; 195 alloy 21.00-22.00; 108 alloy 20.00-21.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.50-21.00; grade 2, 19.00-20.00; grade 3, 18.00-19.00; grade 4, 17.00-18.00.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze, No. 225, 35.25; No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb 36.28; 30,000 lb 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(20,000 lb base; freight allowed over 400 lbs)

Sheets and Circles: 2S and 3S mill finish c.r.

Thickness Ranges, Inches	Widths or Diameters, Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.035	12-48	36.6	33.6	38.4
0.034-0.026	12-48	37.0	34.0	39.1
0.025-0.021	12-48	37.6	34.3	39.6
0.020-0.016	12-36	38.3	35.1	40.4
0.015-0.017	12-36	39.1	35.7	41.3
0.016-0.013	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-48	48.6	44.6	54.1
0.006	12-48	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths, 7 dia., 72-240 in. lengths

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
1S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over

Dia. or Max. Thickness across flats	Round 118-T3	Round 178-T4	Hexagonal 118-T3	Hexagonal 178-T4
Drawn				
0.125	59.6	52.9	...	...
0.156-0.172	50.5	48.5	...	...
0.188	50.5	48.5	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	58.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	54.4	50.2
0.750-1.000	45.4	43.8	48.9	47.3
1.063	44.0	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8.00 in.; rectangles and squares, Class 1, 49.2 to 47.6 in random lengths 0.375-4.0 in. thick, widths 0.750-20.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 10,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¼	$15.05	2	$46.30
½	23.65	4	127.70
1¼	32.00	6	228.50
1½	36.20	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; tread pattern floor plate, 60.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31. Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.60. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube
Copper	48.38b	45.98c	....	48.44
Yellow brass	41.72	41.66	42.26	44.63
Red Brass, 85%	45.44	45.38	45.98	48.25
Low Brass, 80%	44.47	44.41	45.01	47.28
Naval Brass	45.76	40.07	52.80	48.92
Commercial Bronze, 90%	46.95	46.89	47.49	49.51
Nickel Silver, 10%	55.36	59.43g	57.69	....
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23
Silicon Bronze	52.71	51.90	52.75	70.11e
Manganese Bronze	49.48	43.62	54.06	....
Muntz Metal	43.96	39.77	....	....

SCRAP ALLOWANCES f

	Clean Heavy	Rod Ends	Clean Turnings
Copper	26.000	26.000	25.250
Yellow brass	19.750	19.500	18.000
Red Brass, 85%	23.000	22.750	22.250
Low Brass, 80%	22.125	21.875	21.375
Naval Brass	18.250	18.000	17.500
Commercial Bronze, 90%	23.875	23.625	23.125
Nickel Silver, 10%	23.625	23.375	11.813
Phosphor Bronze, A, 5%	26.125	25.875	24.875
Silicon Bronze	25.125	24.875	24.125
Manganese Bronze	18.250	18.000	17.500
Muntz Metal	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 12.00; low copper clippings 9.00; mixed clippings 9.00; old sheet 8.00-8.50; borings and turnings 5.00-5.50; pistons and struts 6.00; crankcases 8.00; industrial castings 8.00-8.50.

Copper and Brass: Heavy copper and wire, No. 1, 23.00; No. 2 copper 21.00; light copper 17.50-18.50; No. 1 composition red brass 16.00-16.50; No. 1 composition turnings 15.50-16.00; mixed brass turnings 9.50; new brass clippings 17.50; No. 1 brass rod turnings 12.00; light brass 13.50; heavy yellow brass 12.00; new brass rod ends 14.00-14.50; auto radiators, unsweated 12.00; cocks and faucets 13.50; brass pipe 15.50.

Lead: Heavy 9.50-10.00; battery plate 5.25-5.75; linotype and stereotype 11.75; electrotype 10.50; mixed babbitt 12.00.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 26.00-28.00; old sheet 24.00-26.00; turnings 19.00-21.00; rods 26.00-28.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50, old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clipping 14.50-15.00; 51S, 52S clippings 14.50-15.00; 14S, 17S, 24S, clippings 13.50-14.50; mixed clippings 13.00-14.00; old sheet 11.25-11.75; old cast 11.00-11.50; clean old cable, free of steel 14.75-15.25; borings and turnings 12.00-12.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00; No. 2 copper 22.25; light copper 20.75; refinery brass (60% copper) per dry copper content 19.00; auto radiators 13.00 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.00-24.50, No. 2 copper 22.50-23.00; light copper 21.00-21.50; No. 1 composition borings 16.50-17.00; No. 1 composition solids 17.00-17.50; heavy yellow brass solids 13.00-13.50; yellow brass turnings 12.50-12.75; radiators 13.00-13.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb 99.5; 200-499 lb 99; 500-999 lb 97.5; 1000 lb or more 97.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00, 200 lb 35.00; 300 lb 34.00; 400-1000 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625, 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: bgg. under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 63.2; 100-500 lb 51.4; 500-1000 lb 48.5; 2000-5000 lb 47.1; 10,000 lb or more 46.

Stannous Chloride (Anhydrous): Less than 50 lb $1.452; 50 lb $1.157; 100-500 lb $1.007; 500-999 lb 98.2; 1000-1999 lb 95.5; 2000-4999 lb 92.1; 5000-19,000 lb 86; 20,000 lb and over 79.5.

Stannous Sulphate: Less than 50 lb $1.20; 50-99 lb 99; 100-1999 lb 88; 2000 lb and over 86.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Aluminum production schedules are beginning to feel effects of seasonal electric power shortages, particularly in the Southeast

SEASONAL power shortages are beginning to knife into aluminum production schedules. To date operations at only one plant have been cut back, but the season is young and drought this summer was severe.

The Southeast is the first to feel the pinch this year. Aluminum Co. of America has five lines down at Alcoa, Tenn., which will drop output about 30 per cent from peak months. Reynolds Metals Co. is using high-cost steam power but hasn't lost any capacity yet at Listerhill, Ala.

More Steam—In the TVA area hydro generation in September hit 899 million kwhr, down 10 million kwhr from September, 1952. But total TVA generation (steam and hydro) stood at 2178 million kwhr, compared with 1613 million kwhr a year ago, which shows the increased dependence on steam for power. Both Alcoa and Reynolds have interruptible contracts with TVA.

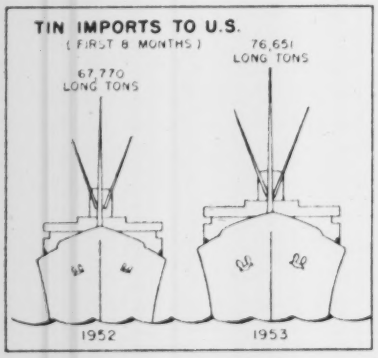
In the Pacific Northwest, Bonneville Power Administration reports water flow as average for this time of the year. No primary aluminum operations have suffered yet.

Over the Dam—Power generation in September totaled 1819 million kwhr, compared with 1369 kwhr a year ago, report Bonneville officials. They say October generation promises to be similarly improved over the same 1952 month and predict waterflow outlook for the next two weeks as "median" or average for the period.

Aluminum companies are buying some steam power from Bonneville (at higher cost than hydro) during periods of peak load to maintain production. Some aluminum men are dubious of the high power output being continued, despite additions of new dams such as Hungry Horse. One comment on the Bonneville prediction: "They're notoriously unreliable." Reserve stocks of ingot aluminum are reportedly being kept by large fabricators as a hedge against repetition of last year's primary losses, regarded by a number of industry men as "normal occurrence in two out of three years."

Metals Business Perks Up

Buying has perked up in the current nonferrous market, and the healthier tone can be found almost across-the-board. Order cancellations have slacked off. Sellers believe they resulted not from bad business but that they are a hangover from short-



age days when consistent overbuying was practiced to get a portion of production needs.

Copper, lead and zinc all held steady pricewise last week as month-end buyers firmed the market. Prospects for November consumption appear good in all of them. Zinc imports have swerved sharply downward in recent weeks as renewed demand abroad took hold. More zinc is being sold at fixed price than during a week ago, but buying remains sporadic.

Lead imports have fallen off since their big jump in August. More forward ordering is noted in day-to-day markets. Copper men are unhappy about the British Ministry of Materials making copper available to consumers freely again. Former policy was to offer spot copper only when private sellers weren't offering the metal. Tin showed a modest improvement pricewise last week, caused mostly by higher prices on London and Singapore exchanges. Actual buying continues moderate.

Freer: Copper and Aluminum

Lowered first-quarter allotments of copper and aluminum mean more of those metals for civilian uses and further underscores industry feeling that both will be free and easy next year. Aluminum mill product deliveries are current; brass mills and copper wire mills can ship from stock in many cases. The 23 per cent drop in copper allotments and 18 per cent in aluminum means less than 20 per cent of available supply of these metals will go for "A" products. "B" products will require set-asides of about 15 per cent above the allotments.

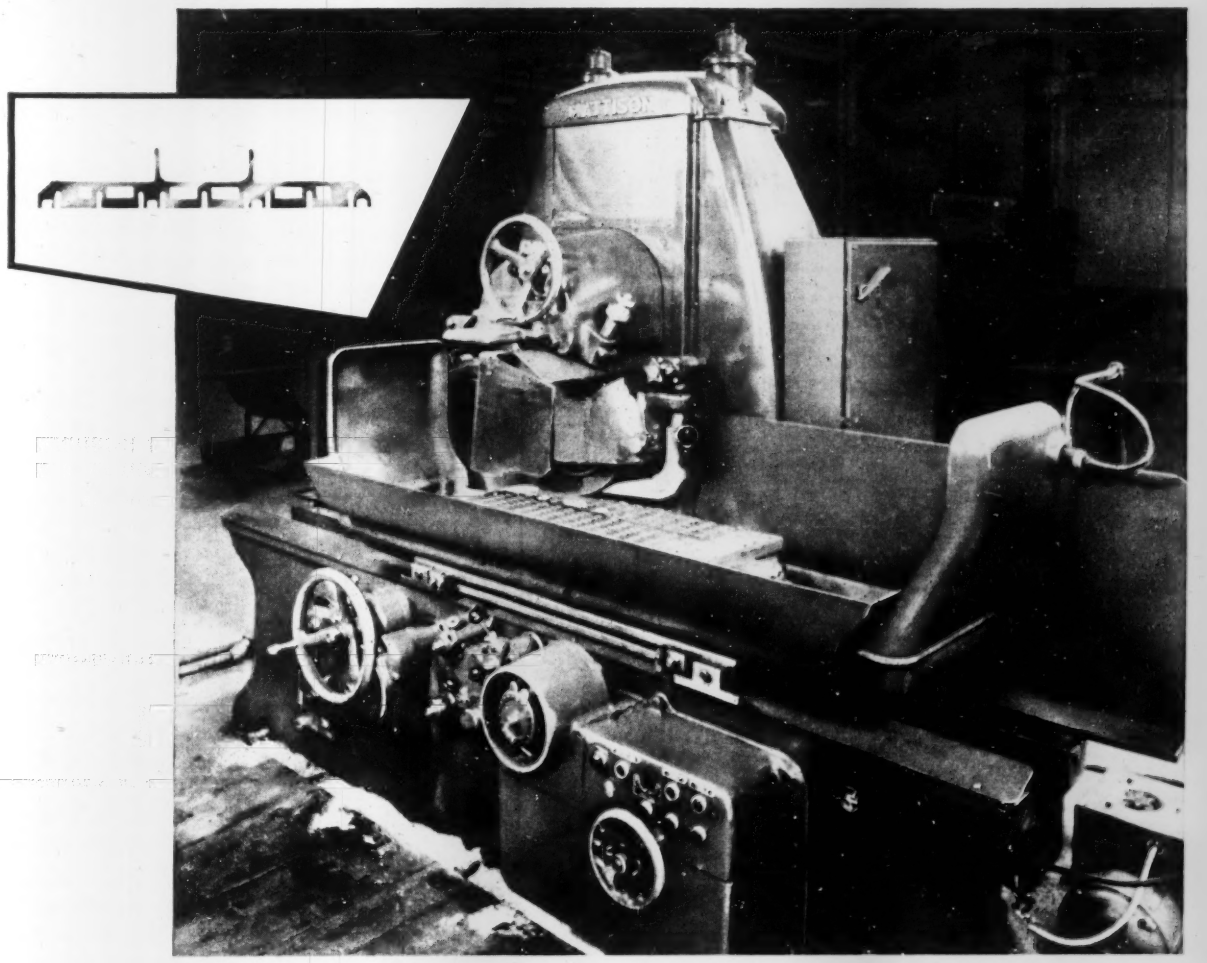
Copper for Russia?

Dollar diplomacy, a term used sneeringly to denounce aspects of U. S. foreign policy, is being given a whirl by the Russians, of all people. Chilean newspapers are full of reports that Russia has offered to pay a premium of 4 to 5 cents a pound for 250,000 tons of Chilean copper over the next three years and will pay 34 cents a pound for 100,000 tons of copper now, payment in dollars.

While the reports are laid to a desire to needle U. S. officials into a quick decision of buying Chile's copper, there's some truth to Russia's need for metals. Rumors have long been circulated about the amount of metal going behind the Iron Curtain. Shipment of 8000 tons of aluminum from Austria to Poland via Switzerland was blocked earlier this year. Good tonnages of lead, zinc, copper, tin, gold and silver are winding up in Russia or satellite states. Cost of the Chilean copper would cost the Soviet nearly $2 billion—and in dollars which it is short of. Suggests one wag: "Maybe we should let them buy it, and spend their way to destruction."

Nonferrous Briefs

- Aluminum Co. of America's sales volume in the first nine months of 1953 hit $544 million, $130 million over last year's same period and only $33 million behind sales for all of 1952. Even sweeter reading for stockholders: Net jumped to $40.1 million, compared with full-year net of $43.5 million last year.
- Doubling of lead output from St. Joseph Lead Co.'s Herculaneum smelter will be accomplished this month as a furnace that has been shut down for repairs comes back into operation. Refined lead output from the plant is expected to hit 8000 tons monthly.
- International Materials Conference's central group is now operating on a "standby basis" with no meetings planned unless new materials emergencies arise.



.020 THICK BLADES GROUND 440 AT A TIME ON MATTISON GRINDER FOR SUNBEAM CORPORATION

Here is an unusual grinding job at the Sunbeam Corporation Plant being performed rapidly and accurately with the Mattison Grinder shown above. 440 Shavemaster blades only .020" thick are ground at one time at a considerable saving in time over previous method.

With the Mattison High-Powered Precision Surface Grinder you have the high power and rugged, double-column construction for rapid stock removal; large capacity which means more pieces of work per load; and the precision and sensitivity necessary for fine, high-quality finish and accuracy to close limits.

This combination not only enables you to step up production on small parts but permits grinding large work which previously could not be handled. Send for free circular containing complete information as well as numerous other examples of work ground on the Mattison Grinder.

MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 145. Key to footnotes, page 147.

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$93.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....81.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 .....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So. Chicago,Ill. U5 ...62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield, Ala. T2 ....75.50
Fontana,Calif. K1 ....94.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 .....75.50
Houston S5 .....85.50
Johnstown,Pa. B2 .....75.50
Lackawanna,N.Y. B2 ..75.50
Los Angeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2 U5,W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 .....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....92.00
Ind.Harbor,Ind. Y1 .....82.00
Johnstown,Pa. B2 .....82.00
Lackawanna,N.Y. B2 ..82.00
Los Angeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 ..82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 .....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 .....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.85
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ...4.775
Monessen,Pa. P7 .....4.725
No.Tonawanda,N.Y. B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 ....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 ..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.625
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2 ...4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.80
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ...4.55
Munhall,Pa. U5 .....4.10
Niles,Calif.(22) P1 ....4.91
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 .....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.30
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 ....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ...6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ...6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 .....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ...4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 .....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.55
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ...4.55
Ecorse,Mich. G5 .....4.50
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 .....4.30
Harrisburg,Pa. C5 .....4.95
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ...4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Seattle B3 .....5.00
So. Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville, O. W10 ...4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 .....4.40
Youngstown R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif (30) K1 6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ...6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.65
Coatesville,Pa. L7 .....5.75
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5 W14 5.55
SparrowsPoint,Md. B2 ..5.55

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.35
Ashland,l.c.l (15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..4.15
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo R2 .....4.15
Canton,O. R2 .....4.15
Clairton,Pa. U5 .....4.15
Cleveland R2 .....4.15
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity, Mo. S5 ....4.85
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Minnequa,Colo. C10 ...4.60
Niles,Calif. P1 .....4.85
No.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 .....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 .....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.375
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 .....4.875
KansasCity, Mo. S5 ....5.575
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton, Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.70
KansasCity S5 .....5.90
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ....5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 .....5.75
Massillon,O. R2, R8 .....5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4 ..5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 .....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 .....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 .....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ....6.10
Youngstown F3, Y1 .....5.20

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.325
BeaverFalls,Pa. M12 ...6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 .....6.325
Carnegie,Pa. C12 .....6.00
Chicago W18 .....6.325
Cleveland A7, C20 .....6.325
Detroit P7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.526
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13 6.326
Hartford,Conn. R2 .....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ....6.775
Massillon,O. R2 R8 ..6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 .....6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 .....6.475
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ..6.625
Youngstown F3, Y1 ...6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ...4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.05
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So. SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....6.18
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....6.25
So.SanFrancisco B3 ....6.25
SparrowsPt, ¼-1" B2 ..5.55
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(4) J5 .....4.75
ChicagoHts.(3) C2 ....4.50
ChicagoHts.(4) C2 ....4.75
ChicagoHts.(3,4) I-2 ...4.50
FortWorth,Tex.(26) T4 ..4.65
Franklin,Pa.(3) F5 ....4.50
Franklin,Pa.(4) F5 ....4.75
Marion,O.(3) P11 .....4.50
Moline,Ill.(3) R2 .....4.50
Tonawanda(3,4) B12 ....5.00
Williamsport,Pa.(3) S19 5.25
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
Me K Rks (Staybolt) L5 15.50
Me K Rks (S.R.) L5 ....10.40
Me K Rks (D.R.) L5 ....14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport Pa. P7 .....3.925
Ashland,Ky.(8) A10 ....3.925
Butler,Pa. A10 .....3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
GraniteCity,Ill. G4 .....4.025
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925
Chicago W18 .....6.325
Cleveland A7, C20 .....6.325
Detroit P7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.526
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13 6.326
Hartford,Conn. R2 .....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass. B5 ....6.775
Massillon,O. R2 R8 ..6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 .....6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 .....6.475
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ..6.625
Youngstown F3, Y1 ...6.325

Munhall,Pa. U5 .....3.925
Newport,Ky. A9 ..... 3.925
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 ..... 3.925
So.Chicago,Ill. W14 ..3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ..3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2..5.225
Dover,O. R1 .....5.80
Mansfield,O. E6 .....5.80
Niles,O. N12 .....5.20
Torrance,Calif. C11 ..5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....7.00
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ....5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So. Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....6.175
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Butler,Pa. A10 .....4.775
Cleveland J5, R2 ....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 ....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2 4.775
Steubenville,O. W10 ..4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ....7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.475
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2..5.275
Ashland,Ky.(8) A10 ..5.275
Canton,O. R2 .....5.275
Dover,O. R1 .....5.525
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ....5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind.(13) C16..5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert Cu Alloy Cu Fe

Ashland,Ky. A10 6.325 ....
Canton,O. R2 ...6.475 6.925
Fairfield T2 ....6.075 6.325
Gary,Ind. U5 ...6.075 6.325
Ind.Harbor I-2 ..6.075 6.325
Irvin,Pa. U5 ...6.075 6.325
Kokomo,Ind. C16 6.525 ....
MartinsFry.,O.W10 6.075 ...
Pitts.,Cal. C11 ..6.825 ....
SparrowsPt. B2 .6.075 ....
Torrance,Cal. C11 6.825 ....

SHEETS, Culvert Pure Iron

Ashland,Ky. A10 ....6.575
Fairfield,Ala. T2 ....6.325
MartinsFerry,O. W10 ..6.325

SHEETS, Galvanneaied Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind.(13) C16..5.925
Niles,O. N12 .....6.35

†Based on 5c zinc

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.875
Ind.Harbor,Ind. I-2 ..5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala. R2 ....3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo (27) R2 ....3.925
Butler,Pa. (8) A10 ..3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 ..... 4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 3.925
KansasCity,Mo.(9) S5 4.625
Lackawna,N.Y.(32) B2..3.925
LosAngeles(25) B2 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ..5.625
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y.B11 3.925
Pittsburg,Calif. C11 ..4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...4.025
Youngstown Y1, U5 ..3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 ....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 ....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ....5.65
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 6.40
SparrowsPoint,Md. B2 6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....6.30
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.80
Bridgeprt.Conn.(10) S15 6.15
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.75
Detroit D2, P20 .....5.70
Detroit M1 .....5.65
Dover,O. G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill.(40) T6 5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.40
NewBritain(10) S15 ....6.15
NewCastle,Pa. B4 .....5.45
NewCastle,Pa. E5 ....5.95
NewHaven,Conn. A7 ...5.95
NewHaven,Conn. D2 ...6.20
Pawtucket,R.I. R3 ....6.80
Pawtucket,R.I.(21) NS..6.65
Riverdale,Ill. (40) A1 ..5.70
Rome,N.Y.(29) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.46
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2(50) 6.40
Warren,O.(40) T5 .....5.95
Warren,O. B9 .....5.75
Warren,O. R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) NS 12.15
Pawtucket,R.I.(12) NS 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.80
Weirton,W.Va. W6 ....8.30
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.95

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div., Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Electric Steel

N2 National Supply Co.
N3 National Tube Div.
N6 Neisen Steel & Wire Co.
N8 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Nues Rolling Mill Div.
N15 Northwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.60	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.60	10.85	...
Carnegie,Pa. S15	...	8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.75	7.85	8.80	...	...
Detroit D2	6.45	7.85	8.45	10.55	...
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
Franklin Park,Ill. T6	5.80	7.80	8.75	10.70	...
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	...	...
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	...
NewYork W3	...	...	8.90	10.85	13.15
Pawtucket,R.I. N8					
Cleve.or Pitts.Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	...	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T3	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown,Cs. ...	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1			12.50	15.00	...
Franklin Park,Ill. T6			12.50	15.00	18.00
Harrison,N.J. C18			12.50	15.00	18.00
NewYork W3			12.50	15.00	18.00
Trenton,N.J. R5			12.50	15.00	18.00
Worcester,Mass. T6			12.50	15.00	18.00
Youngstown,Cs. ...			12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (cut lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	...	7.85	8.35	...	...
Vandergrift,Pa. U5	...	...	8.35	8.85	10.10	10.90
Warren,O. R2	...	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom,W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	...	...	...
Newport,Ky. N9 (cut lengths)	10.95	...	...	...
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	...	...	...
Zanesville,O. A10	11.45	12.00	12.70	13.50
H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	**T-100**	**T-90**	**T-80**	**T-73**
Butler,Pa. A10 (C.R.)	...	...	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Coke (Base Box)	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind.* U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.95

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.775
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. MS	5.525
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.45
Houston,Tex. S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda,N.Y. B11	5.525
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
Sparrows Point,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Mallbury,Mass. (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. MS	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester,Mass. T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. MS	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R5	7.45
Monessen,Pa. P16	8.00
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld.	Galv.
Ala.City R2	6.675	7.075**
Aliquippa J5	6.675	7.20*
Atlanta A11	6.925	7.475
Bartonville(19)K4	6.675	7.225
Buffalo W12	6.675	7.075
Cleveland A7	6.675	...
CrawfordsvilleMS	6.775	7.325
Donora,Pa. A7	6.675	7.075†
Duluth,Minn. A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex. S5	7.075	7.475
JohnstownB2(48)	6.675	7.225
Joliet,Ill. A7	6.675	7.075†
KansasCity,Mo. S5	7.275	7.675
Kokomo C16	6.775	7.175
LosAngeles B3	7.625	...
Minnequa C10	6.925	7.325**
Monessen P7(48)	6.675	7.225
Palmer W12	6.975	7.375
Pitts.,Calif. C11	7.625	8.025†
Petsmth.(18) P12	6.675	...
Rankin A7	6.675	7.075†
So.Chi'go R2	6.675	7.075**
So.S.Frn.(48)C10	7.625	8.025**
Spar'wsPt. B2(48)	6.775	7.325
Sterl'g(1)(48)N15	6.675	7.225
Struthers,O. Y1	6.675	7.175
Worcester A7	6.975	...

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	10.63	12.72*
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	...
Crawfordsville MS	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35
Kokomo C16	12.60	14.15
Minnequa C10	12.75	14.45**
Palmer,Mass W12	12.50	14.05
Pitts.,Calif. C11	12.85	14.40†
So.Chicago R2	12.50	14.05**
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	...

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity R2	155**
Aliquippa J5	150*
Atlanta A11	159
Bartonville,Ill. (19) K4	156
Crawfordsville,Ind. MS	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	156
Minnequa,Colo. C10	156**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
So.SanFrancisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
Ala.City,Ala. R2	140**
Ala.City 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliqp'pa,Pa.9-14½ga. J5	143*
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. MS	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga. 6" B2	234
Johnstown, 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. MS	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W15	131
Cleveland A9	137
Crawfordsville,Ind. MS	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. I7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)	
Conshohocken,Pa. A2	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. MS	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	123
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	136
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 ($)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. ($)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	26.5	−0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W. Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 ($)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*) 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	...	21.31	18.44
1¼	13	...	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.27	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2¾	12	40.51	48.86	35.70
2⅞	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	...	5.20
Fairfield,Ala. T2	...	...	...	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	...	...	...	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	...	...	...	(16)5.20
Lackawanna,N.Y. B2	4.325	4.225	...	5.20
Minnequa,Colo. C10	4.325	4.125	...	5.70
Steelton,Pa. B2	4.325	4.225	...	...
Williamsport,Pa. S19	...	...	...	5.20

TIE PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in.,larger 8.90c

⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	5
⅞-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1½", inclusive	60
1⅝" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" and smaller	40
⅞" to 1½", inclusive	43

Finished Hex Nuts:

New standard, all sizes 58

Semifinished & Slotted Hex:

Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged, per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.	
⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe), (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	78.00
Brass, 20-ton lots	29.50-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	43.25
Reduced	43.25
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	52.00
Minus 100 mesh	57.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

*Plus cost of metal

Footnotes

(1) Chicago base.
(2) Angles, flats, bands
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower
(8) 1⅛ gage and heavier
(9) 6 lb. and narrower
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.219 in.; for gage 0.142 and lighter, 5.80c.
(15) ¼" and thinner
(16) 40 lb and under
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base
(20) 0.25c off for untreated
(21) New Haven, Conn. base
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide
(24) Deduct 0.10c, finer than 12 Ga.
(25) Bar mill bands.
(26) Reinforcing bill lengths, to fabricators, to consumers, 5.40c.
(27) Bar mill sizes
(28) Bonderized
(29) Youngstown base
(30) Sheared; add 0.35c for universal mill.
(31) Rd. or square edge.
(32) To jobbers, deduct 20c
(33) 9.60c for cut lengths
(34) 72" and narrower
(35) 54" and narrower
(36) 15 gage & lighter; 60" & narrower
(37) 14 gage & lighter 48" and narrower
(38) 48" and narrower
(39) Lighter than 0.035", 0.035" and heavier, 0.25c higher
(40) 9.10c for cut lengths
(41) 6.7 gage
(42) U post, add 2 cols. for T post.
(43) 0.025 gage; 0.55c for 0.026 to 0.005 gage; 0.65c for 0.005 gage and over.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound, subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H R Bars, Strip	Shapes; H R & C F Wire	Plates	Sheets	C R Strip, Flat Wire
301	16 25	20 50	29 50	34 25	29 75	35 25	37 25	46 25	38 25
302	17 25	22 75	29 75	34 50	32 00	36 50	37 50	46 50	41 50
302B	18 50	24 50	30 50	34 50	33 00	36 50	37 50	48 75	44 75
303	18 75	24 75	32 25	37 25	36 75	38 25	39 75	48 75	45 50
304	18 25	23 75	31 00	36 00	34 25	37 25	39 75	48 75	43 75
304L			36 75			42 75	45 25	54 25	48 00
305	19 50	25 00		36 25	37 00	37 50	42 00	51 75	46 75
308	19 75	26 25	35 25	40 75	38 00	42 00	46 00	55 25	48 00
309	26 50	34 75	43 25	43 25	43 25	50 50	53 75	63 50	62 00
309S	25 50	33 50	42 50	54 50	54 00	55 50	58 00	68 50	68 50
310	33 00	43 25	56 75	66 25	67 50	67 50	69 00	72 25	78 75
314							69 00	74 50	
316	28 00	36 25	46 75	54 50	55 00	55 50	58 00	64 50	66 50
316L			52 50				61 00	70 00	72 00
317	31 00	43 50	58 25	66 75	67 50	68 25	70 75	77 00	79 25
318	33 50	44 00	59 25	64 50	66 25	65 50	68 75	78 00	80 25
321	22 75	29 50	35 25	40 75	42 00	42 00	46 00	55 50	54 50
330			58 00			68 50	70 00	73 75	77 75
347	24 50	32 25	39 50	45 75	46 50	46 75	51 25	60 75	59 25
403			27 00	30 00		32 00	34 25	44 00	41 25
405	16 50	21 75	25 25	29 25	30 50	30 25	33 75	42 50	39 75
410	14 00	18 25	24 00	27 75	26 25	25 75	30 00	40 75	34 25
416			24 50	28 25		29 25	30 50	41 25	41 25
420	22 00	28 50	29 25	31 00	33 50	35 00	38 00	49 25	52 75
430	14 25	18 50	24 50	28 25	27 00	29 25	30 50	43 50	34 75
430F		18 75	25 00	28 75		29 75	31 00	44 00	44 00
431	14 50	25 50	25 00	28 25	27 50	29 25	30 50	44 00	35 25
440A B C		25 50	29 25	31 00		33 00	38 50	49 25	52 75
442			25 00			39 50	43 25	48 25	47 75
446			33 75	38 25	53 00	39 50	40 75	50 75	71 00
501			14 00	14 50	21 25	16 00	18 25	30 50	29 00
502			15 25	16 00	22 25	17 00	20 00	31 75	30 00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Ajaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates—Carbon Base 10%	Plates—Carbon Base 20%	Sheets—Carbon Base 20%	Sheets—Copper Base Both Sides
302		31 00	31 00	77 00
304	27 60	32 50-32 70	32 50	77 00
310	36 50	41 00		144 00
316	32 60	37 70-42 75	42 75	
318	37 00	42 20		
321	29 30	34 10-37 00	37 00	111 00
347	30 40	35 50-40 50	40 50	130 00
405	23 40	30 60		
410	22 90	30 10		
430	22 90	30 10		
Inconel	41 25	54 18		165 00
Nickel	37 50	50 50		
Monel	38 90	51 80		
Copper*			16 00	

	Strip, Carbon Base—Cold-Rolled 10%	Strip, Carbon Base—Cold-Rolled Both Sides	Strip, Carbon Base—Hot-Rolled 10%	Strip, Carbon Base—Hot-Rolled Both Sides
Copper*	27 50	33 50	21 00	32 25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont Del. C22 Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets in Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20 25	4 25	1 6	12 25		1 955
18 25	4 25	1	4 75		2 340
18	4	2	5		2 565-2 695
18	4	2			1 520
18	4	1			1 580-1 660
13 5	4	3			1 875
6 4	4 5	1 9		5	1 065
6	4	3		6	1 300
2	4 4	1 2			0 495
1 5	4	1		8 5	0 580

Tool steel producers include: A1, A8, B2, B8, C4, C9, C17, C18, D1, F2, J3, L3, M1, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City, AC2	52 88	52 88		
Birmingham, E2	52 88	52 88		
Birmingham, U5		52 88		
Woodward, Ala., W13	52 88	52 88		
Cincinnati, deld		60 43		
Buffalo District				
Buffalo, H2, H1	56 00	56 50	57 00	
Tonawanda, N.Y., W12	56 00	56 50	57 00	
No. Tonawanda, N.Y., T9		56 50	57 00	
Boston, deld	66 62	67 12	67 62	
Rochester, N.Y., deld	59 02	59 52	60 02	
Syracuse, N.Y., deld	60 12	60 62	61 12	
Chicago District				
Chicago, I-3	56 00	56 50	56 50	57 00
Gary, Ind., U5	56 00		56 50	
Indiana Harbor, Ind., I-2	56 00		56 50	
So. Chicago, Ill., W14, Y1	56 00	56 50	56 50	
So. Chicago, Ill., U5	56 00		56 50	57 00
Milwaukee, deld	58 17	58 67	58 67	59 17
Muskegon, Mich., deld		62 80	62 80	
Cleveland District				
Cleveland, A7	56 00	56 50	56 50	57 00
Cleveland, R2	56 00	56 50	56 50	
Akron, O., deld. from Cleve.	58 75	59 25	59 25	59 75
Lorain, O., N3	56 00			57 00
Mid-Atlantic District				
Bethlehem, Pa., B2	58 00	58 50	58 00	59 50
New York, deld.		62 28	62 78	
Newark, deld.	61 62	61 62	62 62	62 62
Philadelphia, deld.	60 75	61 25	61 75	62 25
Birdsboro, Pa., B10	58 00	58 50		
Steelton, Pa., B2	58 00	58 50	59 00	59 50
Swedeland, Pa., A3	58 00	58 50	59 00	59 50
Troy, N.Y., R2	58 00	58 50	59 00	
Pittsburgh District				
Neville Island, Pa., P6	56 00	56 50	56 50	
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57 37	57 87	57 87	
McKees Rocks, deld.	57 01	57 51	57 51	
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	57 99	58 16	58 16	
Verona, Trafford, deld.	58 19	58 69	58 69	
Brackenridge, deld.	58 43	58 93	58 93	
Bessemer, Pa., U5	56 00		56 50	57 00
Clairton, Rankin, So. Duquesne, Pa., U5	56 00			
McKeesport, Pa., N3	56 00			57 00
Midland, Pa., C18	56 00			
Monessen, Pa., P7	56 00			

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O., Y1			56 50	
Sharpsville, Pa., S6	56 00	56 50	56 50	57 00
Youngstown, Y1			56 50	57 00
Youngstown, U5	56 00			57 00
Mansfield, O., deld.	60 50		61 40	61 90
Duluth, I-3	56 00	56 50	56 50	57 00
Erie, Pa., I-3	56 00	56 50	56 50	57 00
Everett, Mass., E1	59 50	63 00	63 50	
Fontana, Calif., K1	62 00	62 50		
Geneva, Utah, C11	56 00	56 50		
Granite City, Ill., G1	57 00	58 50	58 50	
Ironton, Utah, C11	56 00	56 50		
Lone Star, Texas, L6	52 00	52 50*	52 50	
Minnequa, Colo., C10	58 00	59 00	59 00	
Rockwood, Tenn., T3			56 50	
Toledo, O., I-3	56 00	56 50	56 50	57 00
Cincinnati, deld.	61 76	62 26		

*Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O., G2, J1	$67 00
Buffalo, H1	68 25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%, $2 per gross ton premium for 0.04% max P)

Niagara Falls, N.Y., P15	$91 00
Keokuk, Iowa, Openhearth & Fdry., freight allowed, K2	95 50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed, K2	98 50
Wenatchee, Wash., OH & Fdry., freight allowed, K2	95 50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$63 00
Rockwood, Tenn., T3	70 00
Steelton, Pa., B2	64 00
Philadelphia, deld.	67 55
Troy, N.Y., R2	64 00

You're missing something if you overlook

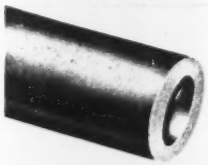
CRUCIBLE HOLLOW TOOL STEEL

If you make tool steel parts with machined-out centers, don't overlook the many benefits of using Crucible Hollow Tool Steel.

It eliminates drilling, boring, cutting-off and rough facing operations. Naturally, this cuts overall production time, steps up machine capacity and reduces scrap losses. Many manufacturers have been able to cut material costs alone by as much as 20% when they use Crucible Hollow Tool Steel instead of regular bar stock.

Crucible Hollow Tool Steel is available in three famous grades: KETOS oil hardening, AIRDI 150 air hardening, and SANDERSON water hardening tool steels. We supply it with machine finished inside and outside diameters and faces — cut to your specific length requirements. And no steel producer can assure you of more uniform quality. For we have complete control over every phase of manufacture and distribution.

For more information, call the Crucible warehouse nearest you . . . or write for new brochure describing Crucible Hollow Tool Steel. Address Crucible Steel Company of America, Dept. S, Oliver Bldg., Pittsburgh 22, Pa.



CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

HOLLOW TOOL STEEL

CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N. Y.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents, Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga †	H R *	C R *	H R Rds.	C F. Rds ‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	6.29	7.61	7.78	7.00		6.86	8.17§	12.01	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00§	6.30		6.15	8.00		6.35	6.35	8.65
Boston	6.85	7.83	9.18	7.13		6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.70		6.55	7.70	12.17	6.56	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.50		7.10	8.37		7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42		6.28	7.30	11.74	6.46	6.33	7.46
Cincinnati	6.01	7.19	8.42	6.72		6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.28		6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.29	6.71	7.36	6.56	7.60	11.92	6.93	6.85	7.80
Erie, Pa.	6.19	7.13	9.01	6.54		6.28	7.70		6.56	6.50	7.79
Houston	7.15	7.60	9.32	7.15		7.45			7.35	7.20	8.55
Jersey City, N. J.	6.53	7.45	8.72	6.82		6.76	8.43§	11.84	6.59	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.31	7.25	8.17	6.60		6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.45	7.47	8.35	6.77		6.63	7.65		6.81	6.68	
New York	6.41	7.45	8.42	6.82		6.76	8.43§	11.84	6.59	6.67	8.01
Newark, N. J.	6.75	7.75	8.42	7.16		7.06	8.43§		6.99	6.99	8.36
Norfolk, Va.	6.90			7.20		7.20	8.50		7.20	7.15	7.85
Philadelphia	6.53	7.55	8.41	7.02	8.80	6.87	8.10§	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55		6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	7.90	9.50	10.00	7.50		7.60	10.65		7.50	7.55	9.40
Richmond, Va.	6.90	7.45	8.00	7.10		7.05	7.95		7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72		6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08		6.94	8.06		7.12	6.90	8.12
San Francisco	7.35	8.70	10.15	7.60		7.14	9.75	13.65	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00		7.60	10.65	13.30	7.50	7.60	9.40
Spokane	8.15	9.405	9.80	8.50		7.60	10.55	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.55	7.51		7.37	8.81		7.49	7.36	8.49

†Prices do not include gage extras. ‡ prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gages extra excluded). § includes 1-cent special bar quality extra. ‖ as rolled. ¶ as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; * 500 to 9999 lb; ** 1000 to 1999 lb; †† 1000 lb and over; ‡‡ 1,000 lb to 3999; ‖‖ under ½ in.

Warehouse Price Trend Turns Downward

Some distributors are absorbing freight and cutting prices on products which are in freer supply. Structural shapes and wide flange beams remain tight in most districts

Pittsburgh Warehouse sales are at a good level, although orders are not as large as in previous months. Increasing competition is noted. Some warehouses are starting to absorb freight and cut prices.

Stocks of bars and sheets are improving but structural shapes remain tight. Supplies of galvanized sheets are well rounded.

Follansbee Steel Corp., Pittsburgh, plans a $750,000 warehouse in Wallingford, Conn., to be completed about June 1, 1954. It will handle cold-rolled strip steel, polished blue steel, seamless terne metal roofing, and sheet specialties.

Cleveland Volume is slightly better than a month ago with some distributors, but over-all, it is about 5 to 10 per cent under that of a year ago at this time. Generally, the warehouses anticipate a steady flow of orders over the remainder of the year and anticipate a good first quarter.

Stocks are virtually in balance except for cold-rolled sheets and wide-flange beams.

Lifting of the ban on use of nickel is permitting the warehouses to dispose of substantial stocks of nickel-bearing stainless which they have held for some time because of inability of consumers to provide tickets. Replacement of these stocks, however, will be extended as it is expected supplies will not be too freely available from the mills.

Chicago Steel warehouses are now free to sell nickel-bearing stainless without restriction. Considerable pressure from consumers is anticipated although so far inquiry has been orderly. Some limitations on tonnages may have to be imposed by warehouses to assure equitable distribution.

Cincinnati Warehouse sales in October appear to be as good or better than sales in September. Inventories are not far from balance. Structurals are the only scarce items.

New York Improvement in warehouse demand centers in carbon products. Individual orders are smaller, but with inventories better balanced, they are more numerous. October sales show some increase over September volume. Alloy orders are slow. Demand for nickel

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM A-305	$4.86	$4.94	$4.86	$5.14
Bar Size Angles	4.53	4.61	4.53	4.81
Structural Angles	4.53	4.61	4.53	4.81
I-Beams	4.80	4.88	4.80	5.08
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft., ¾ x 0.30 lb per ft.	21.30	21.54	21.30	22.14
Barbed Wire	6.19	6.12	6.10	6.33
Merchant Bars	4.81	4.89	4.81	5.09
Hot Rolled Bands	4.97	5.06	4.97	5.25
Wire Rods, Thomas Commercial No. 5	4.68	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.11	5.21	5.19	5.46
Channels	4.80	4.88	4.80	5.08
Bright Common Wire Nails, 8d	6.40	6.50	6.45	6.70

Size O.D.	Wgt. Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

stainless is rising. Inventories are 80 to 85 per cent of normal, but supplies of plates and structurals are unbalanced. Sheet receipts are substantial, including cold-rolled tonnage placed in July.

Philadelphia — Leading warehouses have revised their estimates downward as to October volume. Distributors are having difficulty meeting demand for wide flange beams and heavy plates, especially 1½-inch and over.

Boston — Warehouses are booking more individual small orders but sales totals are below those of first half. Distributors are selling more nickel stainless grades, having built up some stock when many end-uses were banned under M-80. Additional orders are being placed for nickel stainless, some tonnage expected to show up in December and more in January. Plate stocks are improved.

St. Louis — Warehouse inventories are up to the point of surplus in some items. Price softness is notable in sheets. Exceptions are in wide flange beams, wide flats and cold-rolled rounds.

Los Angeles — Small warehouses that sold steel at premium prices, are trimming their sails and are offering sheets at less than standard warehouse prices.

Seattle—Warehouse prices here have been adjusted to more closely approximate those at Portland, Oreg. Order volume is down seasonally the last two weeks. The market is approaching prewar status.

Lower Rail Tariffs Filed

New York — Reduced rail freight rates on iron and steel products from all points in eastern territory to all points in southern territory have been filed with the Interstate Commerce Commission.

The new rates were established to put shippers in eastern territory on a comparable basis with those enjoying similar reductions made by southern railroads. While Nov. 21 is the earliest effective date for the new rates that could be established under ICC regulations, the eastern carriers will ask the commission to make the new eastern rates effective on the same date as the new southern territory tariffs, probably Nov. 5.

The new eastern rates will effect substantial savings for shippers. For instance, at present rates, an 80,000-pound carload shipment from Cleveland to Charlotte, N. C., costs $883.20 in freight, excluding tax. Under the new tariffs, the freight on such a shipment would be $608, excluding tax, a saving of $275.30 for the shipper.

Sheetmakers Hold Comfortable Backlogs

High-level operations assured through fourth quarter for most producers and new business is reported developing for first quarter in satisfactory volume

Sheet and Strip Prices, Page 141 & 145

Cleveland—Pressure for sheets is off some but most mills are fully booked for fourth quarter and first quarter tonnage is being placed in satisfactory volume. Except for the premium-price mills, sheetmakers appear to be holding comfortable order backlogs.

Armco Steel Corp., Middletown, O., has announced a sweeping simplification of its electrical steel nomenclature designed to eliminate some of the confusion caused by proprietary trade names.

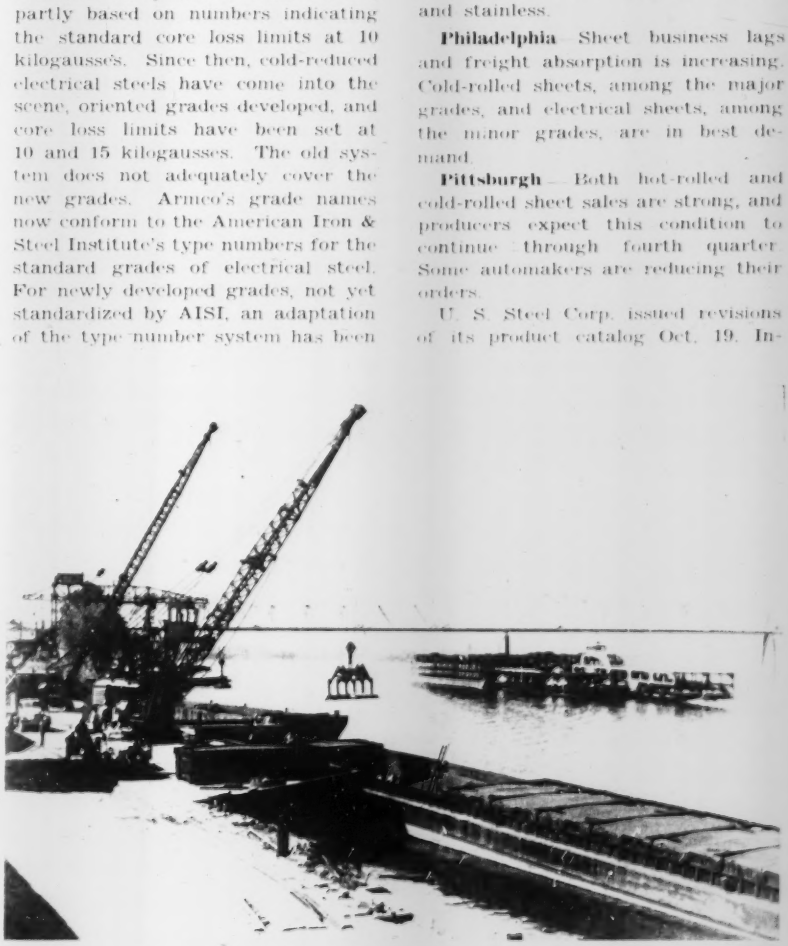
Over a quarter century ago Armco introduced a system of nomenclature, partly based on numbers indicating the standard core loss limits at 10 kilogausses. Since then, cold-reduced electrical steels have come into the scene, oriented grades developed, and core loss limits have been set at 10 and 15 kilogausses. The old system does not adequately cover the new grades. Armco's grade names now conform to the American Iron & Steel Institute's type numbers for the standard grades of electrical steel. For newly developed grades, not yet standardized by AISI, an adaptation of the type number system has been used where possible. There is a clear and simple differentiation between non-oriented and oriented grades. The former are known by the Armco trade name "Tran-Cor", and the oriented are simply called "oriented." Suffixes hot-rolled or cold-rolled to the grade names show the rolling process used.

Boston—Premium prices for cold-finished annealed spring steel, 0.41 to 0.60 carbon are cracking. Several producers have gone to 7.95c, Worcester, from as high as 8.30c. Flat-rolled carbon schedules are filled for fourth quarter, but there are openings on a few specialties, alloys and stainless.

Philadelphia—Sheet business lags and freight absorption is increasing. Cold-rolled sheets, among the major grades, and electrical sheets, among the minor grades, are in best demand.

Pittsburgh—Both hot-rolled and cold-rolled sheet sales are strong, and producers expect this condition to continue through fourth quarter. Some automakers are reducing their orders.

U. S. Steel Corp. issued revisions of its product catalog Oct. 19. In-

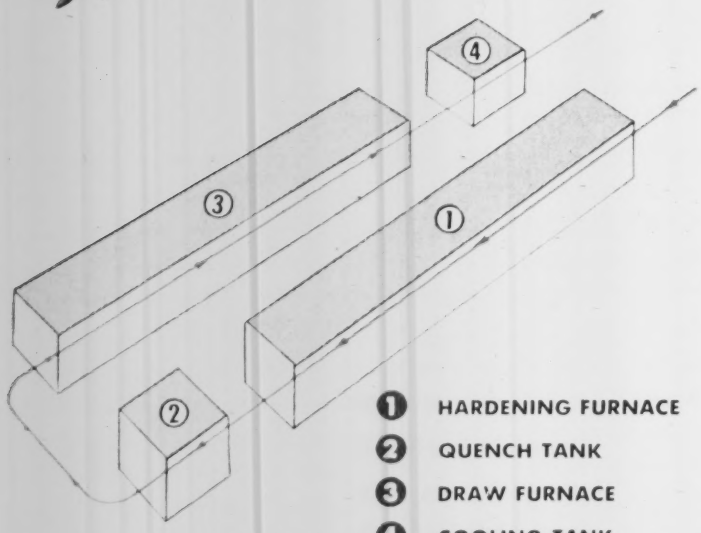


Floating Down the River to New Louisville Warehouse

First bargeload of steel for Jones & Laughlin Steel Corp.'s new plant in Louisville is shown being unloaded at Port of Louisville Terminal Inc. The steel will be trucked to J & L's facility after a 7-day, 604-mile trip from Pittsburgh. Full capacity of the warehouse is 4000 tons of finished steel

Heat Treat Furnace Layout

by Holcroft ...4th of a Series



Automatic Heat Treating Speeds Forging Production

Holcroft developed this automatic furnace unit in order to heat, quench and temper automotive crankshaft forgings.

It consists of a gas-fired hardening furnace, a quench tank, a draw furnace and a cooling tank. So automatic is the production, that a two-man team can handle the entire operation. As a result, the unit contributes materially to trimming production time to a third or even a half of that required by previous methods.

Now, it's entirely possible that this unit costs a little more to install. BUT—a close examination of the cost records indicate savings after savings after savings. Just simple arithmetic proves the economy of a "little more costly" Holcroft furnace. Write today for details. Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Michigan.

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HOUSTON 1: R. E. McArdle, 5724 Navigation Blvd.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario
EUROPE: S. O. F. I. M., Paris 8, France

cluded are products of the Fairless plant.

First production from Pittsburgh Steel Co.'s $12 million cold-rolled sheet mill at Allenport, Pa., is expected early next year.

Youngstown—Republic Steel Corp. boosted output of zinc-coated sheets and strip at its electrolytic lines at Niles, O.

Cincinnati — Most distributors report sheet inventories are in good shape. Volume of business in October is on a par with September.

Effective Oct. 23, Newport Steel Corp., Newport, Ky., announced lower prices for products off its reversing hot mill, $3.925 per 100 lbs base f. o. b., Wilder or Newport, KY. This price applies to hot-rolled steel coils and sheets and places the company in a more competitive position.

A new continuous pickle and slitting line is now in operation at Newport.

Armco Steel Corp., in its third-quarter report, said it is operating at about 95 per cent of ingot capacity and expects to maintain that rate for the rest of the year.

Detroit — Cold-rolled strip is in easy supply and hot-rolled strip is in about the same position. Reflecting ready availability, one producer is reported taking off some furnaces. Balancing of inventories is cited in slackening demand with indications normal supply-demand relationship is in the offing.

Chicago—Cancellations of hot and cold-rolled sheet orders are few but there are certain readjustments in mill schedules occasioned by product redesign requirements. Many consumers press for more fourth and first quarter tonnage than mills in this area can provide.

Inland Steel officials report conversion of steel supplied by customers accounted for 6.5 per cent of the company's third quarter shipments and that some conversion steel would be shipped in the current quarter. However, they added requests for conversion have virtually ceased.

St. Louis—Sheet demand is holding but there is considerable shifting among consumers. Washing machine makers are coming into the market unexpectedly strong.

Los Angeles — Increased requirements from water heater manufacturers has stiffened demand for sheet and strip.

Ferroalloys . . .

Ferroalloy Prices, Page 162

New York — Production of very-low-carbon ferrochrome has been started in the Graham, W. Va., plant of Vanadium Corp. of America.

When you install

NORTHERN OVERHEAD ELECTRIC TRAVELING CRANES

you will have fast, safe, dependable materials handling with an extra margin of safety for overloading under peak or emergency operation—the best mechanical and electrical accessory equipment and controls that can be obtained—precise manipulation, minimum maintenance, and maximum efficiency—integrated engineering design and construction of the highest quality. Ask for Catalogs SE-108 and HL-115-R.

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you will get an extra quality, high hook lift, heavy duty type hoist—the only hoist of this type available. It ranges in capacities from one to 15 tons (100 tons in stationary types) and is adapted for I-beam, monorail or tramrail systems, for floor or cab control—single or variable speeds. Other models also include: double hook, base mounted, and lug suspension hoists. Ask for Bulletin H-113.

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you will save time, maintain production, increase safety with a low cost, simple device which converts your hand powered cranes to motorized control. It can be easily installed by your own mechanics in a few hours without dismantling your present crane. Ask for Bulletin T-105.

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Here Are Facts That Will Amaze You!

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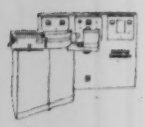
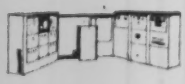


Spectrographic equipment raises his capacity to 150 element determinations per day.



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Plates . . .

Plate Prices, Page 144

New York—Plate demand is active. Yet, certain premium-priced mills are not fully covered for the current quarter.

Mills quoting the minimum price levels are well covered for the remainder of this year and certain producers of moderately premium-priced tonnage are virtually booked up for this quarter. Others are not in such good position.

Boston—There is some slackening in plate orders, but mill books in some cases indicate moderate carryover to January, notably wide, sheared tonnage.

Philadelphia—Some plate tonnage is available for the current quarter, mainly from premium-priced mills. The larger producers anticipate a carryover into first quarter of at least two weeks, and consider themselves fully booked up for January.

Production at Alan Wood Steel Co.'s plant was disrupted last week by a wildcat strike.

Pittsburgh—Most consumers can satisfy their plate requirements, but demand is strong enough some premium-priced plate is still purchased. Predictions are this purchasing will fall off in this quarter while orders remain strong over-all.

Seattle—Plates are scarce. Japanese material is being laid down here at about 6.25c per pound compared with the domestic price of about 5.00c. Where domestic plates are not obtainable consumers are paying the higher import price.

Stainless Steel . . .

Stainless Steel Prices, Page 148

Philadelphia—Removal of National Production Authority controls on columbium releases columbium-bearing stainless No. 20 to general industry, the Alloy Tube Division, Carpenter Steel Co., Union, N. J., announced last week.

Stainless No. 20 with columbium is sulphuric acid resisting and is designed for applications which involve welding during fabrication and those in which the part must be placed in service in the as-welded condition. Sole producer of this analysis in wrought form is Carpenter Steel Co.

The analysis is available in tubing, pipe, sheet and plate in varying size ranges. Typical applications include mixing tanks, heat exchangers, processing piping, metal cleaning and pickling tanks, etc.

Addition of columbium to the alloy minimizes precipitation of carbides during welding. The columbium content is 8 times the carbon minimum of 0.07 per cent.

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Need just a few lengths of seamless brass tube? We'll be glad to hand them to you "over the counter." Or if your job calls for large quantities of brass or copper sheet, rod, wire or tube, we can speed it on its way to you. That's the kind of service you can get by calling your nearest Chase warehouse.

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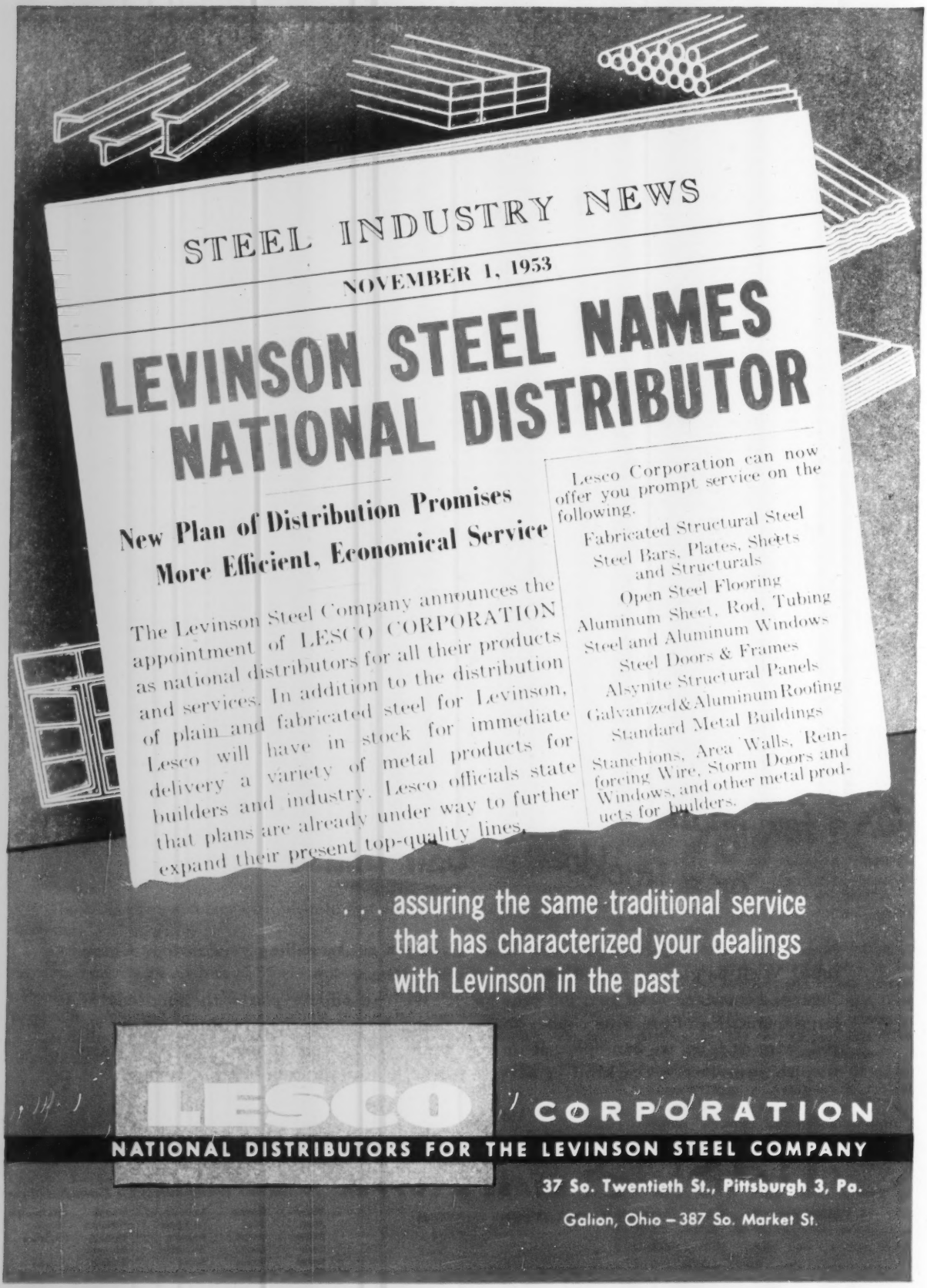
Chicago	Houston	Newark	Rochester†	†sales
Cincinnati	Indianapolis	New Orleans	St. Louis	office only


STEEL INDUSTRY NEWS
NOVEMBER 1, 1953
LEVINSON STEEL NAMES NATIONAL DISTRIBUTOR
New Plan of Distribution Promises More Efficient, Economical Service
The Levinson Steel Company announces the appointment of LESCO CORPORATION as national distributors for all their products and services. In addition to the distribution of plain and fabricated steel for Levinson, Lesco will have in stock for immediate delivery a variety of metal products for builders and industry. Lesco officials state that plans are already under way to further expand their present top-quality lines.
Lesco Corporation can now offer you prompt service on the following.
Fabricated Structural Steel
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. . . assuring the same traditional service that has characterized your dealings with Levinson in the past
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NATIONAL DISTRIBUTORS FOR THE LEVINSON STEEL COMPANY
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Galion, Ohio – 387 So. Market St.

Semifinished Steel . . .

Semifinished Prices, Page 144

Youngstown—District steel operations have declined to 100 per cent of capacity, lowest level since the summer of 1949 except during steel strikes and holiday shutdowns. Three bessemers, 66 open hearths and 24 blast furnaces are operating.

Chicago—Ingot production here last week was scheduled at 97.5 per cent of capacity, drop of one half point from the revised rate of the previous week.

Inland Steel completed installation of its new 46-inch blooming mill. Run-in of the equipment has been under way several days.

Tubular Goods . . .

Tubular Goods Prices, Page 147

Pittsburgh—Seamless tubular products are selling well, both in oil country goods and smaller sizes. Shipments are expected to be strong for the rest of the year.

Chicago—Demand for buttweld pipe has picked up. One producer reports orders for December represent 99.5 per cent of output.

Seattle—Cast iron pipe market is seasonally slow. Little improvement is anticipated for 60 days when larger buyers will seek to cover spring requirements.

Steel Bars . . .

Bar Prices, Page 144

Chicago—Few products have shown more easing than bars in this area. The development springs almost entirely from reduced consumption of farm equipment makers.

Boston—Capacity is open for December alloy bar orders, but carbon schedules are filled except for spot openings, mostly hot-rolled.

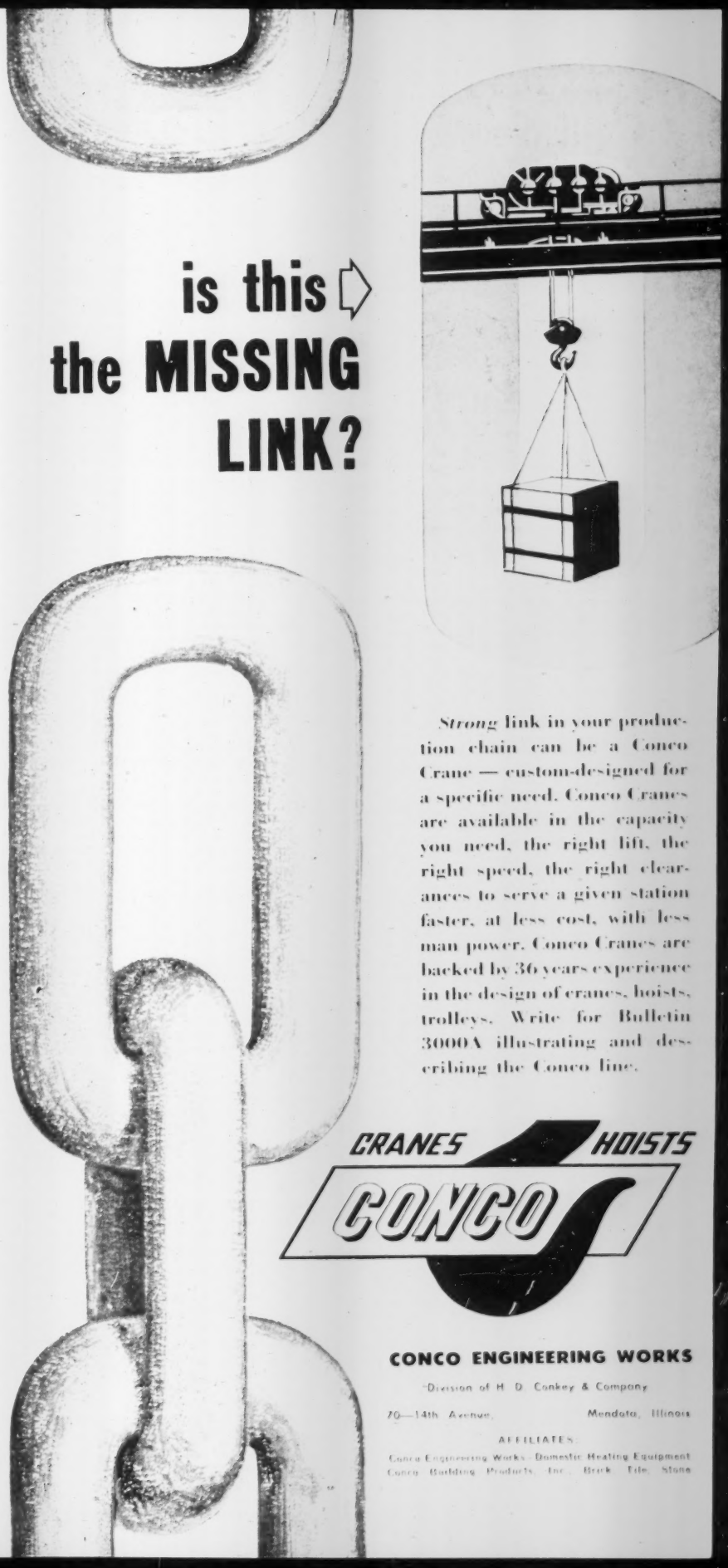
New York—Hot-rolled carbon bar inquiry has slowed appreciably. Some sellers can accept tonnage for current quarter delivery on virtually a full range of sizes.

One factor for the easier situation is arrival of foreign bars ordered last summer.

Philadelphia—Freight absorption is more in evidence in bars. Most sellers of hot-rolled carbon bars can book tonnage for shipment in the current quarter on a wide variety of sizes.

Pittsburgh—Demand for bars is uncertain, due to lingering effects of inventory adjustment. Cold-finished bars are selling well, but demand is not as strong as a month ago.

Cleveland—While the barmakers are seeking business more actively than for a long time past, order backlogs still are substantial despite



Strong link in your production chain can be a Conco Crane — custom-designed for a specific need. Conco Cranes are available in the capacity you need, the right lift, the right speed, the right clearances to serve a given station faster, at less cost, with less man power. Conco Cranes are backed by 36 years experience in the design of cranes, hoists, trolleys. Write for Bulletin 3000A illustrating and describing the Conco line.

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If the question is perforating . . .

Ever stop and think that the answer to your design problem may be simple perforations? Whatever material you're working with, if it's metal, masonite, rubber, plastic, hard or insulated board for decorative or display usage, Hendrick can help you. Over a period of many, many years Hendrick has built up the largest stock of dies commercially available.

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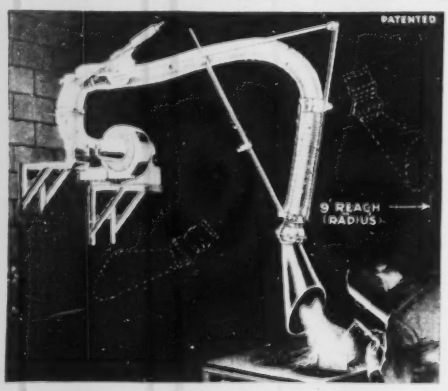
RUEMELIN Fume Collectors

Welding without ventilation. Note smoke and gas clouds.



(Right) Welding with Ruemelin Fume Collector.

REMOVE WELDING FUMES at the Source!

Ruemelin Fume Collectors remove smoke, gas and welding heat. Keep the shop air clean. Efficient and practical. Maximum coverage in welding areas. Your welders work better with this equipment in use. Write for bulletin 37-E describing the new spring-loaded counterbalance mechanism.

Long reach collector extends working range of hood to 15 ft. or 18 ft. operating radius. Double swivel permits hood to work in 360° circle for full coverage.

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the noticeable lessening in demand pressure, and comfortably high production is indicated into first quarter.

Detroit—Small bars continue in easy supply. Large bars more recently have come into easy availability as a result of cutbacks in ammunition programs.

Wire . . .

Wire Prices, Page 146

Boston—High carbon specialties volume is heavier than that for low carbon wire products. Valve spring quality orders from the auto industry are slightly higher for prompt delivery. Demand for clock spring wire is seasonally active.

New York—Wire and wire product schedules for November are making up slowly and, in numerous cases, will not be filled this month. Buying is confined to fill-in or actual new production requirements.

Los Angeles—Wire products from Europe, including nails, are freely available at laid-down prices 10 per cent under domestic quotations.

Tin Plate . . .

Tin Plate Prices, Page 146

Philadelphia—While orders for tin plate continue to decline more than seasonally, consumption has not dropped correspondingly. Consumers specified heavily during first half to be on the safe side in event of a steel strike. Actually, movement of tin plate ran in excess of needs throughout the first eight months. Consumption so far this year is ahead of the corresponding period last year, and for the year as a whole will exceed 1952.

The recent price drop in tin mill secondary products for shipment to domestic consumers follows a slump in export requirements and resulting decline in export prices.

Structural Shapes . . .

Structural Shape Prices, Page 141

Boston—Substantial increase in bridge estimating marks demand for fabricated structural steel. First contract for the Lincoln Square, Worcester project, grade crossing, takes 3040 tons, closing Nov. 17. Industrial and commercial volume is down with public work largely school buildings.

New York—September bookings, reports the American Institute of Steel Construction, were 217,600 tons, down approximately 11 per cent from the revised total of 244,607 for August, but higher than for the same month last year. Total for the first 9 months

NEW

THOMAS MACHINE

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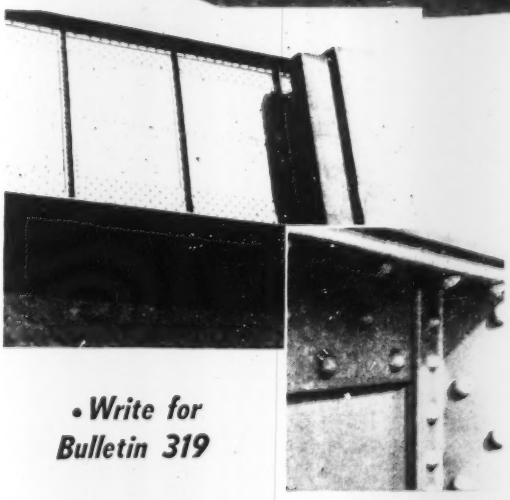
PLATE GIRDER ANGLES

faster... cheaper!



Milling and chamfering of angles is now easier, faster, more accurate, and far more economical, thanks to this newly engineered Thomas machine. It will mill and chamfer the ends of two angles up to 8" x 8" x 1" at a rate of feed up to nine inches per minute.

Adjustable feed controls, transposable cutters, air clamps . . . every worth-while feature that saves time, facilitates operation and prolongs life is to be found in these Thomas Milling and Chamfering Machines, well worth your investigation.

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Punches • Shears • Presses • Spacing Tables Benders

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World's largest stocks of

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STEEL TUBING and BARS

TUBES — Warehouse and mill shipment with more than 200 seamless tube sizes to choose from .950" O. D. to 8.750" O.D.

BARS — In sizes from .171" round to 8.750" round. Warehouse and mill shipment.

WIRE — Mill shipment of hot rolled or cold drawn ball, roller and needle wire.

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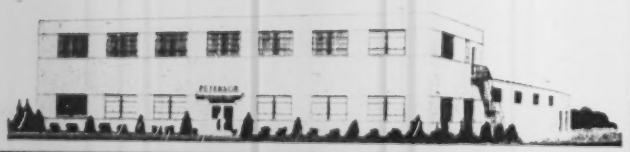
Write for the latest stock list

Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. S.



PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

of 2,238,191 tons compares with 1,938,925 in the like 1952 period.

Shipments of 255,599 tons were slightly ahead of the revised figure of 251,109 tons for August and substantially ahead of the 227,595 for September a year ago. Shipments for the first 9 months amounted to 2,297,482 tons, against 1,952,702 in the like period last year.

Backlog as of Sept. 30 amounted to 2,040,534 tons against 2,342,371 a year ago.

Philadelphia — Structural fabricators are still having difficulty obtaining wide flange beams and bar size flats. Plates in certain gages also remain a problem.

Pig Iron . . .

Pig Iron Prices, Page 148

New York — Despite some optimism among district foundry operators the over-all operating rate continues restricted. Most gray iron shops are operating no more than four days a week. Pig iron sales are limited.

Cleveland — With foundry operations continuing spotty, merchant iron sellers are not moving iron as readily as they would like.

Republic Steel Corp. blew out one of its six blast furnaces here a week ago for relining, leaving five on the active list. The stack will be idle about two months. It was on basic iron.

Chicago — Foundries serving the automobile industry will become more active as new car models go into full-scale production, but prospects from the farm equipment industry point to decreased demand for castings.

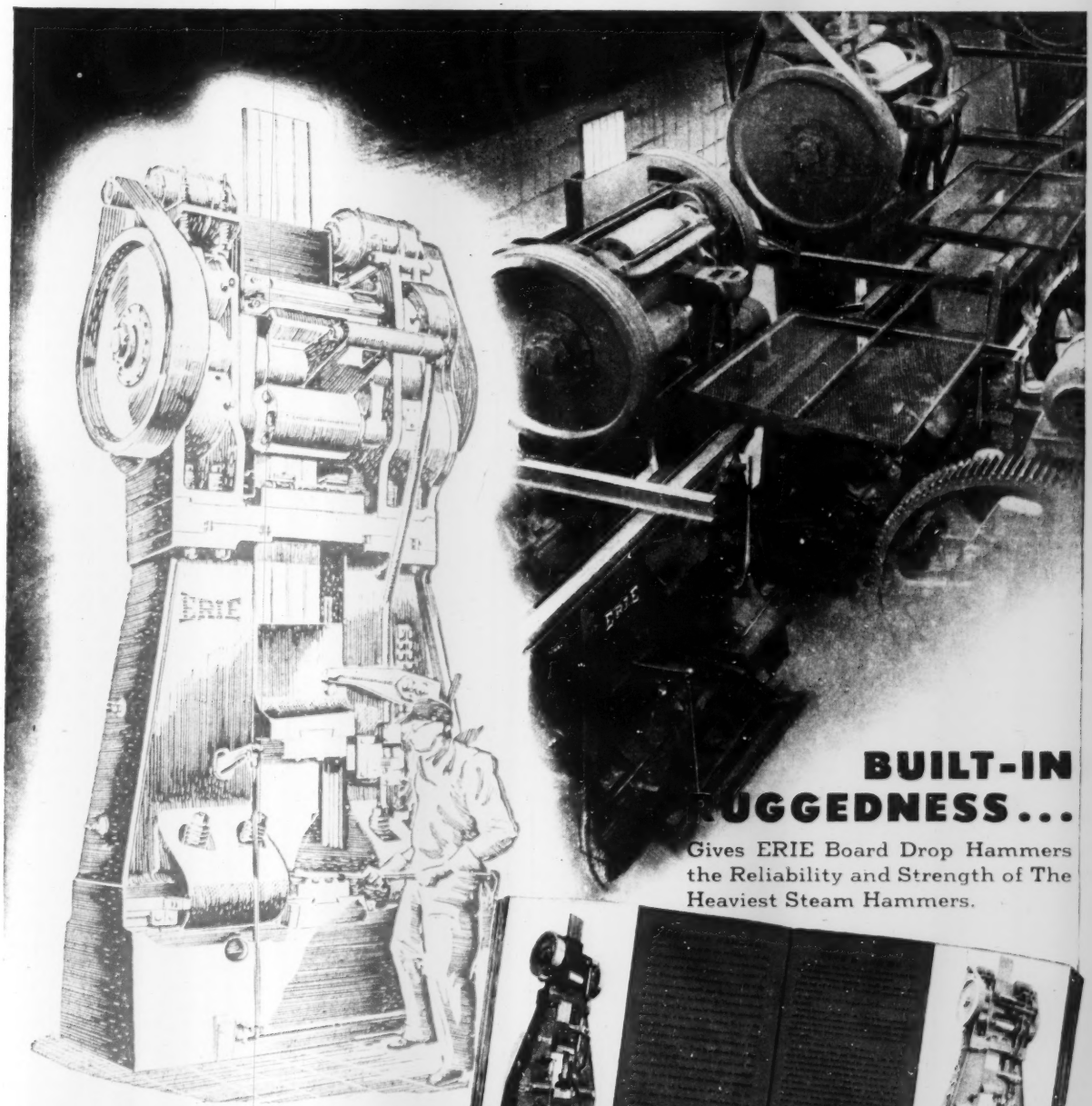
Iron Ore . . .

Cleveland — Iron ore movement from the upper lakes passed the 88,712,313-ton mark for the season to date last week when shipments in the seven days ended Oct. 26 totaled 2,506,527 gross tons.

Consumption of Lake Superior iron ore in September totaled 7,699,110 gross tons. This was a decline compared with 8,150,002 tons in August, but was slightly more than the 7,656,766 tons consumed in September a year ago. Consumption in the first nine months of this year was 72,212,543 tons, a sharp increase compared with 54,265,737 tons consumed in the like period of 1952.

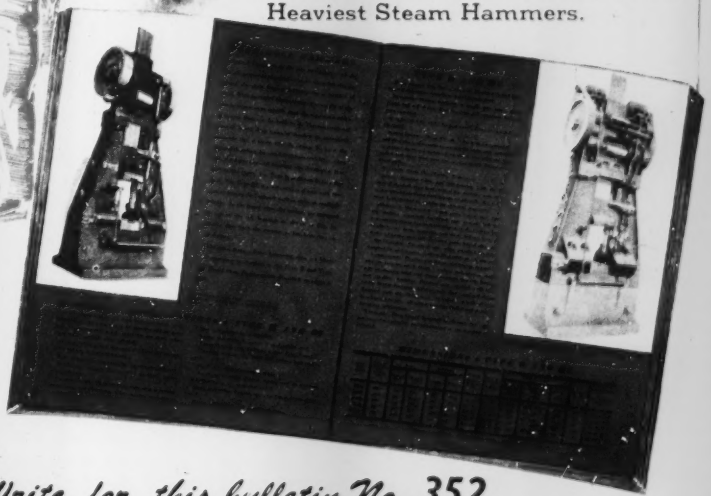
Stocks of ore at furnaces and on Lake Erie docks on Oct. 1 amounted to 51,766,772 gross tons. This compares with 45,579,307 tons on Sept. 1, and with 41,532,214 on Oct. 1, 1952.

At the beginning of this month there were 21 blast furnaces idle in this country.



BUILT-IN RUGGEDNESS...

Gives ERIE Board Drop Hammers the Reliability and Strength of The Heaviest Steam Hammers.



Erie Board-Drop Hammers . . .
Rated from 400 to 10,000 lbs. . .
All parts subject to impact —
upper works, frames, anvil are steel.

ERIE

Write for this bulletin No. 352

ERIE FOUNDRY COMPANY · *Erie, Pa., U.S.A.*

ERIE BUILDS *Dependable* HAMMERS

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $260, Clairton, Duquesne, Johnstown and Sheridan, Pa.; add or subtract $2.60 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland (Oreg.).
(Mn 79-81%) Lump $20% per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C max 7% Si. **Special Grade:** (Mn 80% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 0-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, c.l., lump, bulk 24.7c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.02% C (simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 12-43%, C 0.05% max.) Contract, carload, lump 4" x down and 2" x down, bulk 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant, freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D, packed, max 0.50% carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.6% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb. f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.6c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ⅞ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquetts: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $1.35 per lb of contained W; 2000 lb W to 10,000 lb W, $1.45; less than 2000 lb W, $1.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.50% max) ton lots, 2" x D, $1.75 per lb of contained Cb plus Ta, deld.; less ton lots $1.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base; carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

THE JOBS PROVE IT

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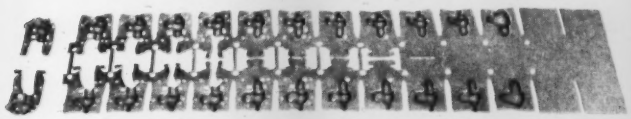
In the small area occupied by a compact Henry & Wright Dieing Machine you have a production tool equal in capacity to five or ten conventional presses. Progressive stamping on a Henry & Wright really pays off, because this press is specifically designed for this type of work.

Angular thrust is not transmitted to the upper crosshead. Low center of gravity holds vibration to an absolute minimum. Long ways, plus four post guidance and a pulling instead of pushing stroke, serve to strait-jacket punch travel. Accurate punching produces high quality work and a lot more of it between die grinds. Much less metal is removed when dies are ground.

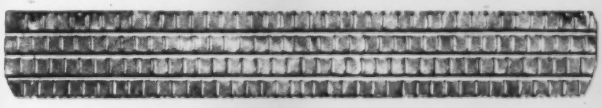
Get the whole story about the Henry & Wright Dieing Machine – the economies you achieve in die life, inspection, toting, operators. Retrench by modernizing with Henry & Wright.

Refrigerator part produced at speed of 65 strokes per minute of .060" cold rolled steel on 100-ton Dieing Machine.

Hemispherical shell 2" deep produced at speed of 60 strokes per minute.



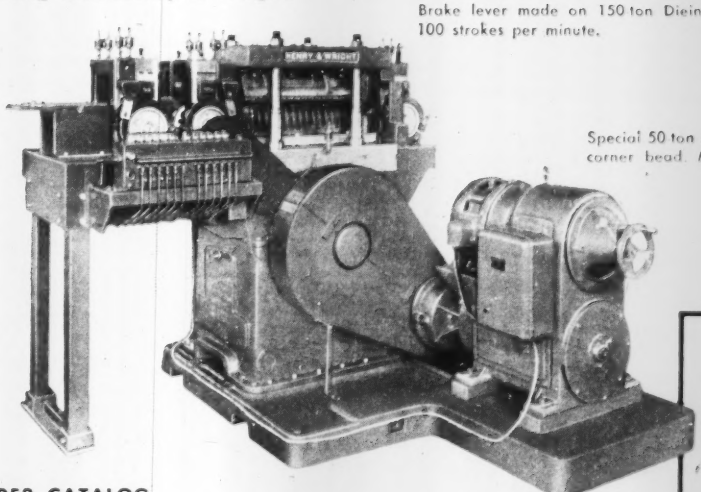
Paired sections of housing produced of .065" hot rolled steel at 60 pairs per minute.



Radiator fin of copper made three at a time at speed of 85 strokes per minute.

Radio part produced one per stroke at speed of 300 strokes per minute.

Brake lever made on 150-ton Dieing Machine operating at speeds in excess of 100 strokes per minute.



Special 50-ton dieing machine for production of expanded corner bead. Machine operates 620 strokes per minute.

1953 CATALOG

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HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

THERE'S A LESSON HERE ON CHOOSING MOTORS

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Regardless of the type of product you make — if you are interested in strength, toughness, uniform structure, resistance to fatigue, long life, lower machining and lower assembly costs — you'll be interested in C Steel Castings. The point is that they are sound, clean, true to pattern castings that by alloy and heat treating possess an almost unlimited range of mechanical properties.

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in *italics*.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65%, WO_3, good commercial quality	$39-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

	Indian and African	
48%	2.8:1	$40.00-$42.00
48%	3:1	44.00-46.00
48%	no ratio	32.00-34.00
	South African Transvaal	
44%	no ratio	$27.00-$28.00
48%	no ratio	34.00-35.00
	Brazilian	
44%	2.5:1 lump	nom. $32
	Domestic	
	(Rail nearest seller)	
48%	3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content deld mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grafton, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Father, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300 F: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk, Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld	*26.00
Chicago, ovens	24.50
Chicago, deld	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld	28.12
Cincinnati, deld	25.85
Painesville, O., ovens	25.50
Cleveland, deld	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld	26.62
Detroit, ovens	25.50
Detroit, deld	26.50
Buffalo, deld	28.08
Flint, deld	28.23
Pontiac, deld	27.06
Saginaw, deld	28.58

*Or within $1.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$14-15
Birmingham area	$19.50

Cents per pound, ovens

Phenol, 40 c.l., nonreturnable drums	17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $41; 70%, $42.50; 60%, $38. Imported, bet ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

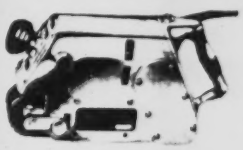
(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
Inches	Inches	
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.50
24	72, 84	9.10
20	60	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55



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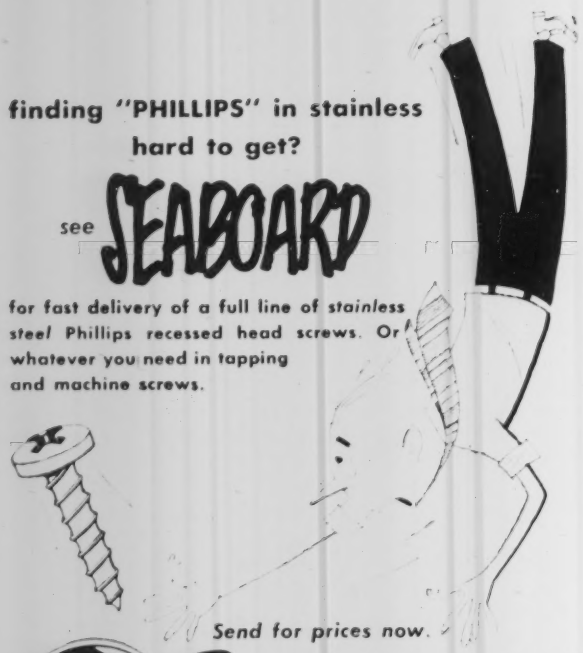

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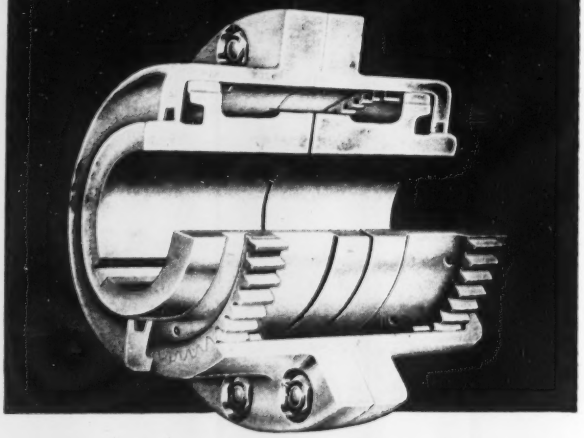

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POE MACHINE & ENGINEERING CO., INC.
New Wilmington, Pa. Phone: 2261

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 165

Pittsburgh—Trend away from production of beehive coke proceeded further with closing of beehives at Mt. Hope, W. Va., by the New River Co. and in Wise county, Virginia, by Continental Coal Co.

The old method of making coke in beehives has been almost entirely replaced by production in coal chemical recovery type ovens. Need for coke during World War II gave a resurgence to beehive production, but since then the beehives have been giving way again to the coal chemical recovery ovens.

Scrap . . .

Scrap Prices, Page 170

Chicago—Purchases a week ago established steelmaking grades of scrap at prices $1 over those paid a month ago. The principal transaction, not notably large, pegged No. 1 heavy melting at $34, No.2 heavy melting at $29, No. 1 factory bundles at $35 and No. 2 bundles at $27.

New York—Scrap brokers' buying prices are steady with little new consumer demand to provide a test. Slow collections are imparting strength to the market. Only revisions in prices are in stainless steel scrap.

Buffalo—Scrap dealers await placement of new orders by two top mill consumers. Dealers have virtually cleared old orders and a showdown on prices is anticipated.

Philadelphia—Scrap prices are unchanged with the undertone a shade stronger. The local trade is convinced the easing of the ban on exports will have relatively little bearing on the market here.

Pittsburgh—Scrap market activity has declined, but underlying strength has replaced the pessimism displayed last month. Improved sentiment has not yet resulted in substantially higher prices, although turnings and borings increased $1 a ton last week.

Cleveland—In the absence of active demand for scrap it is difficult to determine the exact level of prices. However, dealers and brokers appear more optimistic and based on their views prices on some steel grades are up slightly, but are entirely nominal. Automotive lists reportedly are bringing out bids $5 above a month ago.

Youngstown—Higher prices are developing in the scrap market here. An order for 1000 tons was reported placed here, calling for $33 for No. 2 bundles and $35 for No. 2 heavy melting steel, including brokerage and freight. Some orders for No. 1 steel were reported seeking takers at $36. Sharon Steel Corp. was reported buying some low phos scrap at $36.

Cincinnati—Scrap prices are unchanged. There has been no new buying. One large consumer in this area may shut down furnaces.

Detroit—The market in No. 1 grades is showing strength in this area. Broker coverage gave initial impetus to the move last week and as lists closed indications were price hikes of about $2 would show in premium grades.

St. Louis—Scrap brokers have boosted buying prices to stimulate the rural areas' nearly-dead collections.

Laclede Steel Co. last week came into the market with a new formula under which it will pay $2 more for No. 2 melting steel and No. 2 bundles originating outside the St. Louis switching district.

Los Angeles—With mills holding ample inventories, movement of scrap is slowing.

San Francisco—Scrap prices are not expected to go any lower in the immediate future. Mills are accepting shipments against current commitments. Cast grades remain steady.

Seattle—The Pacific Coast scrap trade is hopeful easing of export regulations will bring a healthier market tone. Japan is showing no interest in surplus grades, No. 2 and No. 3 bundles, but is inquiring for No. 1 heavy melting and No. 1 bundles which are not too plentiful in the Northwest.

In spite of the recent price drop sufficient good scrap is being received to cover requirements. Mills are buying despite substantial inventories.

Toronto, Ont—Business has flattened out in the Canadian scrap iron and steel markets and consumer buying is dull. Mills are placing small tonnage orders for most steel grades but have withdrawn from the market for mixed borings and turnings with the result dealers have dropped the price $1 per ton to $22.50. Cast scrap also is down $2 to $16 with demand light.

Canada . . .

Toronto, Ont.—Steel controls in Canada ended a week ago. Consumers no longer have to certify end-use, and producers no longer are required to keep inventory records for government inspection.

Canadian steel production in the first eight months of 1953 totaled 2,712,000 ingot tons. This was a substantial gain over the 2,420,000 tons produced in the like 1952 period.

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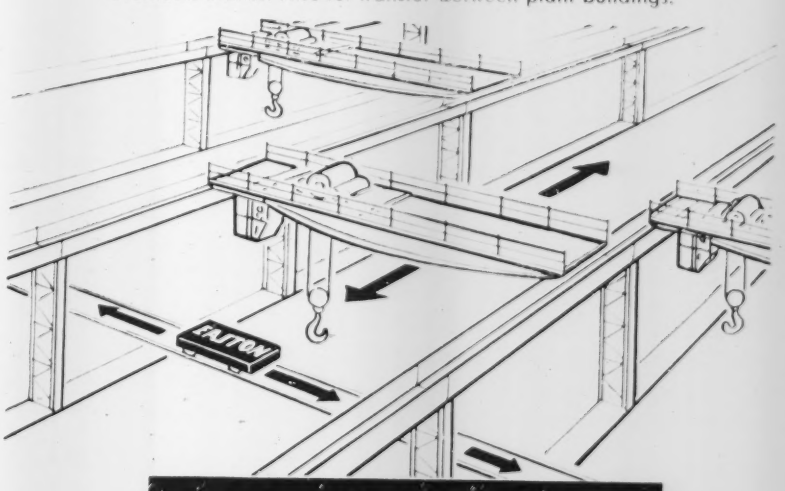

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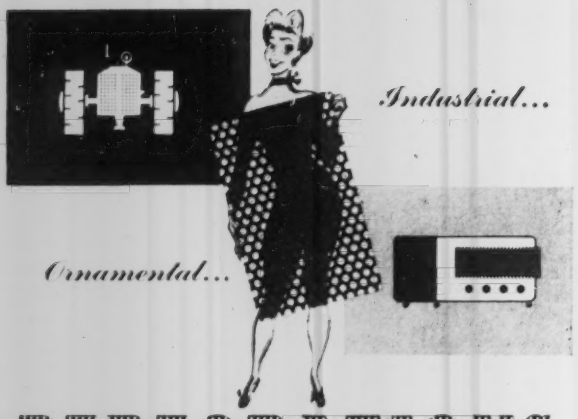

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Over a Quarter of a Century of Dependable Service and Quality Products

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

11,500 tons, towers and anchorages, Philadelphia-Gloucester bridge over the Delaware river to Bethlehem Steel Co., Bethlehem, Pa.

4480 tons, bridges, Ohio turnpike, Cuyahoga county, Ohio, to Fort Pitt Bridge Works, Pittsburgh.

1200 tons, Prospect Expressway, Brooklyn, N. Y., through Charles F. Vachris, Inc., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

850 tons, Donnell building, New York Public Library, New York City, through Psaty & Fuhrmen, Inc., to Bethlehem Fabricators, Bethlehem, Pa.

650 tons, public school No. 6, Woodmere, N. Y., through Psaty & Fuhrmen, Inc., to Bethlehem Fabricators, Bethlehem, Pa.

500 tons, work in connection with water plant and boiler house, Sinclair Refining Co., Marcus Hook, Pa., to unnamed fabricator.

447 tons, state bridge, Youngstown, through Standard Engineering Construction Co., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

370 tons, Union Carbide & Carbon Co., warehouse, Hackensack, N. J., to Savory & Glazier, northern New Jersey fabricators.

275 tons, miscellaneous constfiuction, Carbide & Carbon Chemical Co., Texas City, Tex., to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, Delaware, Lackawanna & Western railroad overpass, Newark, N. J., through Kucher Bros., general contractors, to Bethlehem Steel Co., Bethlehem, Pa.

230 tons, office, garage and warehouse, General State Authority, Harrisburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, Harlem retail market, New York City, through Ranes Construction Co., to Bethlehem Fabricators, Bethlehem, Pa.

155 tons, Boro Park Library, Brooklyn, N. Y., through Ranes Construction Co., to Bethlehem Fabricators, Bethlehem, Pa.

125 tons, Sacred Heart school, Cambria Heights, N. Y., through Frank Drdesch, Inc., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, Harlem River Drive improvement, New York, through Allen S. Spooner, Inc., to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

3040 tons, grade crossing elimination, first contract, Lincoln Square project, Worcester, Mass.; bids Nov. 17, Department of Public Works, Boston.

1853 tons, state bridge work, Allegheny county, Pa., bids Nov. 20; also 170 tons of reinforcing steel.

1240 tons, state bridge, Luzerne-Lackawanna counties, Pennsylvania, Gasparani Contracting Co., Scranton, Pa., low on general contract.

891 tons, state bridge work, Philadelphia, bids Nov. 20; also 330 tons of reinforcing bars.

600 tons, warehouse, Quaker Oats Co., Shiremanstown, Pa., bids asked.

470 tons, state bridge, Pennsylvania, Francis A. Canuso, Philadelphia, low on general contract.

200 tons, Army shops at Whittier Base, Alaska; bids in.

170 tons, eight steel frame structures, Hanford Works, Washington state; J. G. Watts Construction Co.; or L. H. Hoffman, Portland, Oreg., low for two different designs, same project.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, housing project, New Haven, Conn., to Ceco Steel Products Co., Hillside, N. J., through Fusco-Amatruda & Co., New Haven, Conn., general contractor.

215 tons, Washington state Union Slough bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Roy T. Earley Co., Tacoma, Wash., general contractor.

REINFORCING BARS PENDING

3320 tons, bridges and highways, Ohio turnpike, Wood county, Ohio; bids Nov. 10, Ohio Turnpike Commission, Columbus, O.; also 355,700 square yards, 10-inch reinforced concrete pavement.

2000 tons, bridges and highways, Ohio turnpike, Mahoning county, Ohio; bids Nov. 10, Ohio Turnpike Commission, Columbus, O.; also 277,000 square yards, 10-inch reinforced concrete pavement.

1200 tons, First Ave. So. bridge, Seattle, Wash.; bids to Olympia, Wash., Nov. 24.

990 tons, bridges and highway, Ohio turnpike, Sandusky county, Ohio; bids Nov. 10, Ohio Turnpike Commission, Columbus, O.; also 146,000 square yards, 10-inch reinforced concrete pavement.

330 tons, state bridge work, Philadelphia, bids Nov. 20; also required are 891 tons of structural shapes.

300 tons, grade crossing elimination, first contract, Lincoln Square project, Worcester, Mass.; bids Nov. 17, Boston; also 160 tons steel sheet piling, and 150 tons, cast iron blast plates.

170 tons, state bridge work, Allegheny county, Pa., bids Nov. 20; also 1853 tons of structurals.

PLATES . . .

PLATES PLACED

950 tons, 15 tanks, Esso Standard Oil Refining Co., Fayetteville, N. C., to unstated fabricator.

810 tons, steel water line, Manhattan Water Works, Bronx, N. Y., to Walsh-Holyoke Boiler Works, Holyoke, Mass.

140 tons, pressure vessels, Monsanto Chemical Co., Texas City, Tex., through M. W. Kellogg Co., New York, to unnamed fabricator.

PLATES PENDING

935 tons, structural plate, type 2, grade B, class 1; bids Nov. 16, contracting officer, air field depot, Topeka, Kan.

700 tons, 36 and 24-inch water system expansion; bids to Seattle Oct. 28.

PIPE . . .

CAST IRON PIPE PLACED

170 tons, 8 and 6-inch water mains, Port Angeles, Wash., to Hugh G. Purcell, Seattle, for U. S. Pipe & Foundry Co.

(Please Turn to Page 172)

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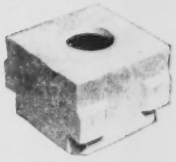

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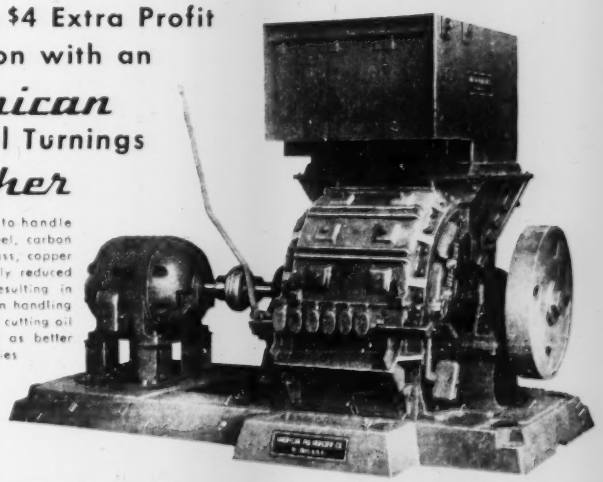

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in *italics*.

STEELMAKING SCRAP COMPOSITE

Oct. 29	$33.83
Oct. 22	32.83
Sept. avg.	36.93
Oct. 1952	43.00
Oct. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	*21.00-22.00*
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals	*38.00-39.00*
Heavy turnings	*30.00-31.00*
Punchings & plate scrap	*38.00-39.00*
Electric furnace bundles	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Charging box cast	*38.00-39.00*
Heavy breakable cast	*36.00-37.00*
Unstripped motor blocks	*32.00-34.00*
No. 1 machinery cast	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 2-ft. and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	44.00-45.00
Railroad specialties	42.00-43.00

Stainless Steel Scrap

18-8 bundles & solids	165-170
18-8 turnings	90-95
430 bundles & solids	87-90
430 turnings	60-62

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*$2.00-33.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*25.00-27.00*
Short shovel turnings	*28.00-29.00*
Cast iron borings	*28.00-29.00*
Low phos.	*$3.00-34.00*
Alloy free, short shovel turnings	*28.00-29.00*
Electric furnace bundles	*$3.00-34.00*

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Charging box cast	*$0.00-41.00*
Stove plate	*37.00-38.00*
Heavy breakable cast	26.00-27.00
Unstripped motor blocks	*28.00-29.00*
Brake shoes	*$6.00-37.00*
Clean auto cast	45.00-46.00
No. 1 wheels	*40.00-41.00*
Burnt cast	*$0.00-41.00*
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00-37.00
R.R. malleable	*45.00-46.00*
Rails, 3 ft. and under	*50.00-51.00*
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	*43.00-44.00*
Cast steel	*42.00-43.00*
Railroad specialties	*42.00-43.00*
Uncut tires	*40.00-41.00*
Angles, splice bars	*45.00-46.00*
Rails, rerolling	49.00-50.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	35.00-36.00
No. 2 bundles	*31.00-32.00*
Machine shop turnings	*17.00-18.00*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Low phos.	*36.00-37.00*
Electric furnace bundles	*36.00-37.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	31.00-32.00
No. 2 bundles	27.50-28.50
No. 1 busheling	*34.00*
Electric furnace bundles	*35.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	26.00
Structurals & plate	36.00-37.00
Heavy turnings	30.00
Couplers, spring, wheels	41.00-42.00
Rail ends, 2 ft & under	45.00-46.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	nom.
Heavy breakable cast	38.50
Unstripped motor blocks	28.00
Drop broken machinery	40.00-41.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
Machine shop turnings	14.00-15.00
Mixed borings, short turnings	13.50-14.00
Low phos. (structural & plate)	29.50
Short shovel turnings	14.50-15.50

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	*165.00-175.00*
18-8 borings, turnings	*85.00-90.00*
430 sheets, clips, solids	*80.00-85.00*
430 sheets, clips, solids	*70.00-75.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	18.50-19.00
No. 1 bundles	24.00-25.00
No. 2 bundles	16.50-17.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	25.00-26.00
No. 1 busheling	31.00-32.00
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos., 18-in.	39.00-40.00

Cast Iron Grades

No. 1 cupola	42.00
Heavy breakable cast	35.00
Charging box cast	35.00
Drop broken machinery	46.00

Railroad Scrap

No. 1 R.R. heavy melt	34.00-35.00
Malleable	42.00-43.00
Rails, 18-in. and under	48.00-49.00
Rails, random lengths	39.00-40.00

CHICAGO

No. 1 heavy melting	*$3.00-34.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 factory bundles	*34.00-35.00*
No. 1 dealer bundles	*32.00-34.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals, 3 ft.	*37.00-38.00*
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	*32.00-33.00*
Stove plate	*26.00-28.00*
Unstripped motor blocks	*19.00-20.00*
Clean auto cast	*36.00-38.00*
Drop broken machinery	*36.00-38.00*

Railroad Scrap

No. 1 R.R. heavy melt	*35.00-36.00*
R.R. Malleable	40.00-41.00
Rails, 2-ft. and under	45.00-46.00
Rails, 18-in. and under	47.00-48.00
Angles, splice bars	40.00-42.00
Rails, rerolling	*45.00-47.00*

Stainless Steel Scrap

18-8 clips & solids	*160.00-160.00*
18-8 turnings	*nom. 70.00*
430 clips & solids	*70.00*
430 turnings	*45.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*29.00*
No. 2 heavy melting	*23.00*
No. 1 bundles	*29.00*
No. 2 bundles	*23.00*
No. 1 busheling	*29.00*
Machine shop turnings	*14.00*
Mixed borings turnings	*14.00*
Short shovel turnings	*15.00*
Punchings & plate scrap	*36.00*

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	40.00
Malleable	40.00

BUFFALO

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	18.00-19.00
Mixed borings, turnings	21.50-22.50
Short shovel turnings	23.00-24.00
Cast iron borings	21.50-22.50
Low phos.	37.00-38.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	33.00-34.00
No. 1 machinery	39.00-40.00

Railroad Scrap

Rails, random lengths	41.00-42.00
Rails, 2 ft and under	46.00-47.00
Railroad specialties	44.00-45.00

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.50
Short shovel turnings	20.50-21.50
Cast iron borings	20.50-21.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	29.00-30.00
No. 2 bundles	*24.00-25.00*
Machine shop turnings	13.00-14.00
Short shovel turnings	15.00-16.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	29.00-30.00
Heavy breakable cast	29.00-30.00
Unstripped motor blocks	*28.00-29.00*
Brake shoes	35.00-36.00
Clean auto cast	37.00-39.00
Burnt cast	*30.00-31.00*

Railroad Scrap

Malleable	37.00-38.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	*39.00-40.00*
Rails, rerolling	*44.00-45.00*
Uncut tires	*$3.00-34.00*
Angles, splice bars	*36.00-37.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	29.00
No. 2 heavy melting	25.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	12.00-12.50
Short shovel turnings	12.00-12.50
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	*$0.00-41.00*

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	*11.00*
Cast iron borings	*11.00*
Cut structurals	*28.00*
Heavy turnings	*11.00*
Punchings & plate scrap	*28.00*
Electric furnace bundles	*22.00*

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	38.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-40.00

HAMILTON, ONT.

(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	*23.50*
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

Cast Iron Grades†

No. 1 machinery cast	*46.00*

†F.o.b., shipping point.

Make it the Biggest Bonus ever— Give it in U.S. Savings Bonds

If your company is one of the more than 45,000 companies that have the Payroll Savings Plan you *know* what your employees think of Savings Bonds—they spell it out for you every month in their Savings Bond allotments.

If you don't have the Payroll Savings Plan, and are wondering whether your people would like to receive their bonus in Bonds, here are a few significant facts:

—every month, *before they get their pay checks or envelopes*—8,000,000 men and women enrolled in the Payroll Savings Plan invest $160,000,000 in U. S. Savings Bonds.

—the ranks of Payroll Savers are growing: On June 30th sales of $25 and $50 Savings Bonds, the sizes purchased chiefly by Payroll Savers, were 6% and 9% higher than in the corresponding period of 1952.

—Payroll Savers hold their Bonds: 75% of the $7,400,000,000 Series E Bonds which had matured up to June 30, 1953, were being retained by their owners beyond maturity under the automatic extension program.

—on June 30, 1953, the *cash value* of Series E and H Bonds—the kind sold only to individuals—totaled $36,043,000,000, a new high.

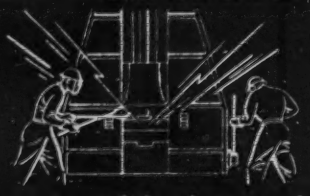
It costs no more to give your Christmas Bonus in Savings Bonds. To the Payroll Saver, and to the man who buys his Bonds at a bank (because his company does not provide the Payroll Savings Plan) a One Hundred Dollar Savings Bond looks bigger and better than a check for $75. *Make this a merrier Christmas for every employee. Give the gift that keeps on giving.*

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

STEEL

The Weekly Magazine of Metalworking

M·S·A EAR DEFENDERS

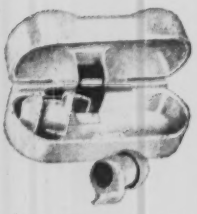


keep harmful noises *out!*

If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal, easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.



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Braddock, Thomas & Meade Sts.
Pittsburgh 8, Pa.

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TRADE MARK

RODINE

REG. U.S. PAT. OFF

PICKLING ACID INHIBITORS

SAVES ACID

SAVES STEEL

SAVES MONEY

Use "RODINE" for improved pickling and increased production!

"RODINE" meets Government Specification No. U.S.N. 51-1-2.

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AMBLER, PA.

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RAILS, CARS . . .

LOCOMOTIVES PLACED

Norfolk Southern, three 1600-hp diesel locomotives, to the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

Canadian National, 4780 box cars, with 1400 fifty-ton box cars and 210 seventy-ton hopper cars going to the National Steel Car Corp., Hamilton, Ont.; 1200 fifty-ton Hart type cars and 100 thirty-ton flat cars to the Canadian Car & Foundry Co., Montreal; 500 seventy-ton gondolas, 250 fifty-ton box cars, 300 seventy-ton triple hopper cars and 100 thirty-ton box cars to the Eastern Car Co., Sydney, N. S.; 200 high side gondolas to the General American Transportation Corp., Chicago; 100 fifty-ton box cars and 100 seventy-ton flat cars to the American Car & Foundry Co., New York, and 200 seventy-ton hopper cars to Marine Industries Ltd.

Fruit Growers' Express, 280 fifty-ton refrigerator cars to Pacific Car & Foundry Co., Renton, Wash.

Illinois Central, 1500 fifty-ton box cars to own shops at Centralia, Ill.

Northwestern, 30 fifty-ton box cars to American Car & Foundry Co., New York.

Santa Fe, 100 seventy-ton covered hopper cars, to the Pullman-Standard Car Mfg. Co., Chicago.

Southern, one 150-ton and fourteen 125-ton depressed center flat cars to own shops.

Spokane, Portland & Seattle, 500 box cars to Brainerd, Minn., shops of the Northern Pacific.

Union Tank Car Co., 500 fifty-ton tank cars to own shops.

Western Maryland, 250 seventy-ton drop-end gondolas to Bethlehem Steel Co., Bethlehem, Pa.

WANTED

All types of steel, steel products, plumbing supplies, brass goods, etc., for distribution to dealers in the Florida area.

Write Harry Markowitz, Inc.
Wholesale
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WEST BLAST MACHINES
Brand New—At Reduced Prices

Size 30 x 30. Well known manufacturer. Process superior to other metal surface treatments. New principle employed. Especially suitable for removing organic and inorganic coatings, plating, and heat-treat scale. Replacement parts guaranteed.

$885 per machine.
Write Box 812, STEEL
Penton Bldg. Cleveland 13, Ohio

World's Largest Inventory

NEW and REBUILT
MOTORS
GENERATORS
TRANSFORMERS
1 to 1500 H.P.
ELECTRIC EQUIPMENT CO.
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CASH
FOR USED TRANSFORMERS

Convert your used transformers to cash! Send us a description of them TODAY.
TRANSFORMERS AND COILS BUILT TO YOUR SPECIFICATIONS.
Send blueprints for prompt quotation.
TRANSFORMERS BOUGHT, SOLD AND REPAIRED
40 Years of Dependable Service

THE ELECTRIC SERVICE CO.
5315 Hetzel St., Cincinnati 27, Ohio

RAILROAD EQUIPMENT—FOR SALE

USED AS IS RECONDITIONED

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity

Box, Double Sheathed, 50-Ton Capacity

Box, Single Sheathed, 50-Ton Capacity

Flat, 50-Ton, Steel Underframe, 40'6" Long

Gondolas, Composite, or All Steel 50-Ton and 70-Ton

Hoppers, Twin, All-Steel, 50-Ton, Cross Dump

Ore Hoppers, All-Steel, 50-Ton, Heavy Duty

Tank, 3,000-Gallon, High Pressure

Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door

End Dump, 20-Yd., 50-Ton, Drop Door

Side Dump, 30-YD., 50-TON, DROP DOOR

OTHER EQUIPMENT

Jordan Spreader

Locomotive Cranes

Overhead Cranes

Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

300 H.P., 70-Ton, Type 0-4-4-0

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Send us your inquiries

SERVICE-TESTED REPAIR PARTS For All Types of Freight Cars

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Chicago 33, Illinois
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New York 7, N. Y.
Phone: BEekman 3-8230

Send us your offerings

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED

Accounts Wanted

KINDRED LINES WANTED

Successful organization in Western New York, selling and warehousing bronze and cast iron billets and bushing stock, machined bronze bushings and flat ground steel, cast iron and malleable iron castings and shell process molding machines, desires kindred accounts to handle. Write Box 831, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

MASTER MECHANIC AND CHIEF POWER ENGINEER. Graduate with 20 years' heavy experience in maintenance of all Rolling Mill mechanical and electrical equipment and the operation and maintenance of all boiler and power generations. Write ENGINEER AND MASTERMECHANIC, 331 West Marquette Road, Chicago 21, Illinois.

TECHNICAL MEN. A progressive specialty steel company located in the East is organizing a Research and Development Laboratory and needs several competent Junior and Senior technical men capable of filling responsible positions. Write Box 840, STEEL, Penton Bldg., Cleveland 13, Ohio.

SUPERINTENDENT, capable of assuming aggressive supervision of 350 man factory producing complete products from steel plate, castings, stampings, machine shop and finishing. Excellent Southwestern Michigan location. Long established AAA-1 company. Real opportunity. Send A-1 detailed record only. Photo and salary requirements. Strictly confidential. Reply Box 842, STEEL, Penton Building, Cleveland 13, Ohio.

Positions Wanted

DROP FORGE SUPERINTENDENT

Experienced in all phases and equipment—steel yard to finished product. M.E. degree. Employed desires change. Write Box 833, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER

Qualified by proven record covering twenty years practical experience. Engineering Degree Massachusetts Institute Technology, supplemented with training in accounting, costs and industrial engineering. Reply Box 845, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED

ROTARY PUMP ENGINEER AND DESIGNER

Excellent opportunity for qualified engineer with background in rotary pump field. We are an old line well established manufacturing concern located close to Chicago loop. Engineering degree, experience in proper pump applications and sales engineering desirable. Replies confidential. Send complete personal history. Salary open. Reply Box 841, STEEL, Penton Building, Cleveland 13, Ohio.

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Sales Representative and Sales Engineer, preferably under 40 years old, to handle exclusively a well established line of Wire Products sold to Industries in Philadelphia and surrounding areas. Products well known in territory, with many active accounts developed from aggressive selling and advertising during past 15 years. Compensation earned by generous commission formula. Applicant should state age, education, full details of part business and selling experience, what automobile is available and facts about family and residence.

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Penton Building Cleveland 13, Ohio

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LIBERTY CO.

HOUSTON 2, TEX. CHICAGO 4, ILL.
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10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
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Largest Inventory on Pacific Coast

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OF WASHINGTON

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FOR SALE

Approximately 50 tons 2⅝ x ⅞ cold rolled strip. WI-1015, dull finish, ¼ temper, 4 edge, deep drawing quality, in coils approximately 500 lbs. each.

Approximately 95 tons 1⅝" Rd. cold drawn ES-1117, random lengths. Material for use on M-1 Burster Casing.

Approximately 114 tons 1½" Rd. Cold Drawn ES-1118, random lengths. Material for use on M-1 Burster Casing.

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Robert J. Fleming

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404 Logan Street

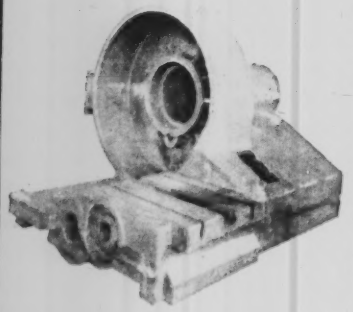
Adrian, Michigan

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Gray Iron Castings

Castings of any size up to 80,000 pounds. Hyde Park facilities are equal to your every requirement



Machine Castings
Lathe Beds
Housings
Pinion Housings
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Shoe Plates
Layout Plates
Surface Plates

Hyde Park
FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

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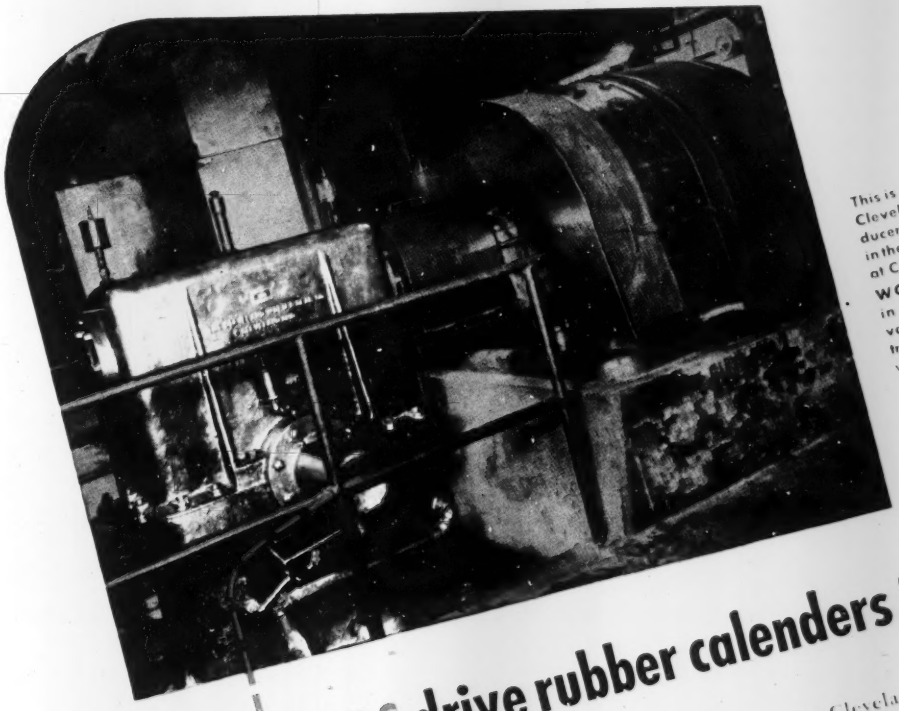


This is one of the two 29-year-old Cleveland worm gear speed reducers driving rubber calenders in the United States Rubber factory at Chicopee Falls, Mass.

WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

Twin CLEVELANDS drive rubber calenders 217,157 hours

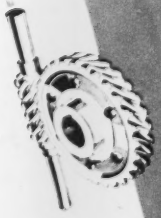
HERE'S eloquent testimony to the long wear in Clevelands: In 1924 the United States Rubber Company installed two Cleveland worm gear speed reducers to drive two rubber calenders. In 1955, some 217,157 work hours later, these same two units are still performing their jobs as efficiently and economically as the day they were first put into service. Throughout these 29 years, these Clevelands have operated 24 hours around the clock, except Sundays.

This dependable, low-cost performance has influenced the management of this company to install other Cleveland drives on other calenders.

You'll find Cleveland worm gear speed reducers delivering the same outstanding service throughout the chemical and allied industries, driving conveyors, agitators, dryers, kilns —wherever a rugged right angle drive is needed—one that transmits power quietly, smoothly and evenly.

Whatever your power transmission problems, you will find ready solutions in Cleveland drives. Write today for new Catalog 400. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND
Worm Gear
Speed Reducers

THE THREE CUTLER-HAMMER STARS

★ ★ ★

STAND FOR THREE NEW STANDARDS

☆ installs easier

☆ works better

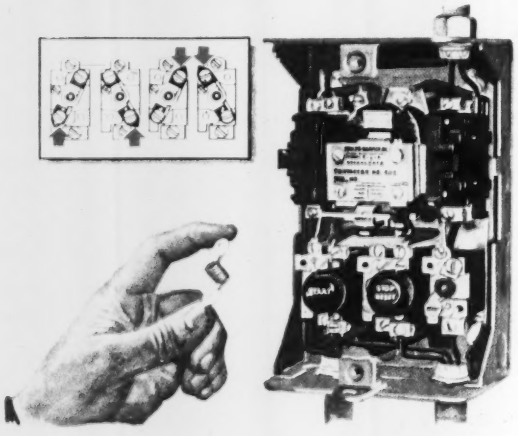
☆ lasts longer

Electrical interlocks...

Up to four extra control circuits may be added by simple installation of interlock blocks. Contacts can be normally open, normally closed, or both. A screw driver is the only tool needed.

Adjustable overload coils...

Each heater coil can be placed in any of four positions to permit adjustment of the overload protection to within 3% of the motor rating...compared to 10% or 12% on competitive control.



Full three-phase protection...

Another Cutler-Hammer "first!" Now the widely demanded three-coil overload protection, so necessary to prevent single-phasing motor burn-outs, is here as an optional feature in standard starter constructions and enclosures. *Complete* 3-Phase protection ...without the high cost of special starter assemblies or the many problems of cumbersome off-size enclosures.

Better performance is more than a mere claim in the spectacular new Cutler-Hammer Motor Control. Field tested for more than two years in hundreds of the most difficult jobs before it was ever released for sale. Compared with every make of control by actual users...to have most say, "Better than anything we have ever used!" Loaded with new features, a few of which are described all too briefly above. Try it now! Order from your nearby Cutler-Hamme. Authorized Distributor today. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin.

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